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BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 1 1953

CHRONIC BRONCHITIS: AN INTRODUCTORY EXAMINATION OF EXISTING DATA*

BY

N. GOODMAN, B.Sc. R. E. LANE, M.D., F.R.C.P.

AND

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(From the Nuffield Department of Occupational Health, University of Manchester)

During 1950 a survey was made of the registered disabled persons in four areas of Great Britain. Particular attention was paid to the causes of disablement and to the effects of disability on employment. In all four areas chronic respiratory disease was an important cause of disability; in the north-western area it was the largest single disease group among registered disabled persons and accounted for more unemployment than any other physical condition. This led to an examination of the data available on death and sickness resulting from chronic respiratory disease among the general population. These data are summarized here.

I. MORTALITY

In much of what follows the Registrar-General's figures are used. It is first of all necessary to understand what is implied by "chronic bronchitis" when used as a cause of death on death certificates. It is likely to cover a wide range of conditions from bronchiectasis or chronic bronchitis and emphysema to the degenerative conditions, often primarily cardiovascular, of the older age groups. The Registrar-General has often indicated that there is an overlap between bronchitis and pneumonia as the primary cause of death, and also a similar overlap between deaths caused by respiratory and heart diseases at older age groups. Indeed, as long ago as 1848, William Farr pointed out that "bronchitis and other inflammations or congestions of the chest were . . . the causes of many deaths, particularly among persons afflicted with asthma and heart disease."

If a large proportion of deaths are assigned indifferently to respiratory or myocardial causes, a study of the respiratory deaths alone may give a misleading impression. For this reason, where possible, deaths from bronchopneumonia and from the group of deaths termed "myocardial degeneration" are considered in parallel with those from bronchitis.

The change in 1939 of the Registrar-General's method of selecting the primary cause of death from certificates with multiple causes has greatly affected the respiratory group of deaths. Under the rules prevailing before 1939 any heart disease was chosen as the primary cause of death in preference to a respiratory disease when both were mentioned together. From 1939 the deaths have been classified according to the primary cause given by the doctor signing the death certificate. The effect of this change can be judged by the fact that the 1938–9 bronchitis mortality figures would show a "100% increase at all ages for each sex, the effect being smallest at ages under 5 and greatest at ages between 55 and 75" (Registrar-General, 1947). Thus, in general, the figures of respiratory deaths before and after 1939 cannot be compared other than for the crude total rate for which the Registrar-General gives conversion factors.

As mortality from bronchitis is negligible below the age of 50, it is unlikely that the mortality rates will be affected very much by the exclusion of those in the armed Forces during the war years.

Sex and Age Differences

When used for comparing groups such as men and women inaccuracies in classification are likely to affect both sexes equally and comparison can be informative.

Fig. 1 gives the age specific death rates from bronchitis for men and women separately. The rates for men are three to four times those for women of the same age; the mortality of men of each age group is, in fact, very similar to the mortality of women 10 years older. (A similar difference between the rates for men and women is found in the Scottish figures, although the rates are in fact lower.) Examination shows that this is not due to more women than men being certified as dying of heart disease.‡

*A précis of some of the main points formed a contribution to a symposium on chronic bronchitis at the Annual General Meeting of the Association of Physicians of Great Britain and Ireland in May, 1952.

†Working on a Medical Research Council grant.

‡A difference of three times in the respiratory rates would mean that nearly all the female deaths attributed to "myocardial degeneration" would have had to be misdiagnosed in this way. This is very unlikely, especially as the male rate from this cause is already about one and a half times that of the female. Moreover, the male/female ratio for death rates from myocardial degeneration has remained constant throughout this period. The group of bronchitis deaths which also had myocardial disease mentioned on the certificate as a contributory or secondary cause of death were tabulated by the Registrar-General up to and including 1945 and formed about 30% of all bronchitis deaths for both sexes at 45–54, 37% at 55–64, and about 40% at 65–74 years.

That men have a higher death rate than women for all causes is a well-known feature of the past 100 years, and during this period the male excess has steadily increased (Martin, 1951). The rates from bronchitis, however, show a greater male excess than for all causes, the male/female ratio for bronchitis being more than twice that for deaths from all causes in age groups 45–54 and 55–64, while for the 65–74 age group the male/female ratio was in excess to a smaller degree. The myocardial degeneration group of deaths and deaths from bronchopneumonia, however, shows a male excess much nearer the excess for all deaths (Table I).

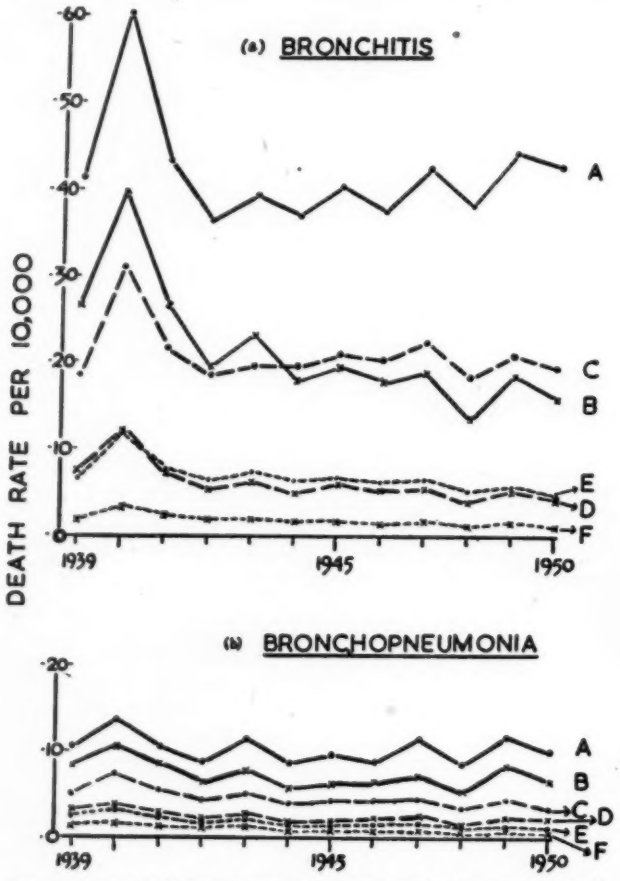

FIG. 1.—Bronchitis and bronchopneumonia death rates, 1939–50. A=Men aged 65–74. B=Women aged 65–74. C=Men aged 55–64. D=Women aged 55–64. E=Men aged 45–54. F=Women aged 45–54.

TABLE I.—*Ratio of Male to Female Death Rates in Age Groups*

Year	Bronchitis			Broncho-pneumonia			Myocardial Degeneration			All Causes		
	45–54	55–64	65–74	45–54	55–64	65–74	45–54	55–64	65–74	45–54	55–64	65–74
1939 ..	3·5	2·5–	1·6	1·9	1·6	1·3	1·4–	1·4	1·2	1·5–	1·5	1·4
1940 ..	3·6	2·6	1·5	2·0	1·6	1·3	1·5–	1·5–	1·3	1·6	1·6	1·4
1941 ..	3·3	3·1	1·6	1·9	1·9	1·2	1·4	1·5	1·3	1·5	1·6	1·4
1942 ..	3·8	3·6	1·9	1·9	1·9	1·4	1·3	1·7	1·4	1·5	1·6	1·4
1943 ..	3·8	3·2	1·7	1·9	1·8	1·4	1·5	1·6	1·3	1·5	1·6	1·4
1944 ..	3·8	4·0	2·1	2·4	2·1	1·5	1·6	1·6	1·3–	1·6	1·7	1·5–
1945 ..	3·8	3·5–	2·1	2·1	2·2	1·5	1·4	1·5–	1·3–	1·5	1·7	1·5–
1946 ..	4·1	3·9	2·1	1·9	1·9	1·4	1·3	1·6	1·3	1·5	1·7	1·4
1947 ..	3·6	4·1	2·3	1·9	1·6	1·6	1·5–	1·6	1·3	1·6	1·7	1·5–
1948 ..	3·9	4·7	2·8	1·8	2·2	1·6	1·5–	1·6	1·3	1·5	1·8	1·5
1949 ..	3·6	4·1	2·4	1·7	1·8	1·4	1·3	1·6	1·3	1·6	1·8	1·5
1950 ..	4·4	4·4	2·7	1·5	1·6	1·5	1·3	1·4	1·3	1·6	1·8	1·5

Social Class

The most recent data on social class mortality are for the triennium 1930–2, when there was an inverse relationship between the death rate from respiratory disease and the social class. The mortality from bronchitis (Fig. 2, Tables II and III) in social class V (unskilled workers) for both men and women was about five times as great as that for social class I (professional classes). For myocardial disease the correlation with social class is also similar, but the gradient is less steep. Sutherland (1947) has pointed out that each social class consists of a conglomeration of occupations which show a wide range of mortality rates within each class. He examined the variation between these classes compared with that within each class. This has been done here for both bronchitis and myocardial diseases, and the observed gradient with social class was statistically significant for both of these disease groups.†

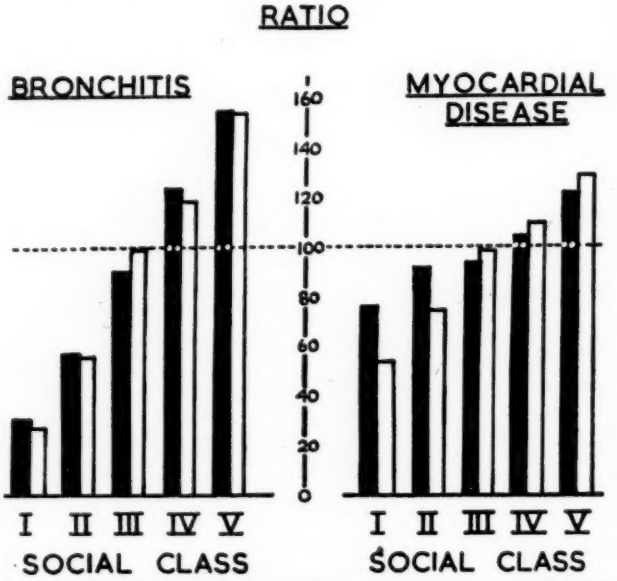

FIG. 2.—Distribution of deaths from bronchitis and myocardial disease according to social class, 1930–2. Ages 20–65 years. The mortality for all men (black columns) or all married women (open columns) is represented by 100.

TABLE II.—*Bronchitis Deaths, 1930–2. Standardized Mortality Rates*

Social Class	Men		Married Women 35–65	Single Women 35–65
	20–65	35–65		
I	31	31	27	87*
II	57	57	57	
III	91	92	99	58
IV	124	126	121	
V	156	157	156	78
All social classes, including unoccupied ..	100	100	100	100

* Including unoccupied single women.

One of the striking features of Fig. 2 is that, although the actual rates for men were higher than for women, the *ratio* of deaths between the various social classes was similar for the two sexes. It would appear, therefore, that in 1930–2 some at least of the factors which determined this ratio affected men and women equally, and these would more likely be of a general environmental rather than of an exclusively occupational nature.

To see if the association between social class and chronic bronchitis still exists in spite of changed conditions, a more up-to-date measure is available. Wilkins (1952) found that a useful measure of the socio-economic status of towns is the percentage of households in which the chief wage-earner has a basic wage exceeding £7 10s. a week. He estimated this percentage for the county boroughs of

†As in Sutherland's paper, the analysis of variance was applied to the logarithms of the standardized mortality ratios, as these, unlike the ratios themselves, were normally distributed. The ratio of the between to within variances were for bronchitis 7.7 ($P<0.001$) and for myocardial diseases 5.8 ($0.01>P>0.001$).

TABLE III.—*Bronchitis Deaths, 1930–2. Comparative Incidence of Social Class Mortalities. (Rate for all Social Classes, Including Unoccupied in Each Age Group=100). (From Registrar-General's Decennial Supplement, 1931)*

Social Class	Men					Married Women					Single Women				
	20–	25–	35–	45–	55–65	20–	25–	35–	45–	55–65	20–	25–	35–	45–	55–65
I	—	D	D	32	33	—	—	D	D	D	—	—	—	—	—
II	D	67	53	55	59	—	D	44	67	55	—	D	D	D	47
III	88	79	86	90	94	D	106	98	99	98	59	58	82	100	117
IV	D	113	129	122	127	—	92	114	111	126	D	—	—	E	170
V	155	142	169	170	147	—	148	167	149	157	—	—	—	—	E
Unoccupied	E	737	E	E	45	—	—	—	—	—	335	271	162	106	93

D and E indicate deficit or excess when there are fewer than 20 deaths recorded.

England and Wales for 1949–50. When this was compared with the bronchitis figures there was a significant correlation between it and the bronchitis death rates for men aged 45–64 in county boroughs for 1947–8 ($r=-0.65\pm0.12$). Many factors are reflected in this measure, but it does show that there is still at the present time a correlation existing between bronchitis deaths and conditions grouped vaguely as "socio-economic."

Region and Degree of Urbanization

The highest death rates from bronchitis are experienced in the northern and western parts of England and Wales (see Table IV and Fig. 3). The conurbation of South-east

TABLE IV.—*Bronchitis Deaths, 1950. Rates per 10,000 per Year*

Standard Region	Age 45–54		Age 55–64	
	M	F	M	F
England and Wales ..	10·8	2·5	43·0	15·8
Northern	13·2	3·2	40·5	18.7
Tyneside conurbation ..	18·8	3·3	63·8	28·1
Remainder	11·2	3·2	32·3	15 2
E. and W. Riding	13·6	3·3	56·1	18·7
W. Yorks conurbation ..	15·0	4·1	63·3	19·8
Remainder	12·6	2·5	50·8	17·8
North-western	16·4	4·7	61·7	26·0
S.E. Lancs conurbation	20·8	6·2	77·8	34·4
Merseyside ,, ..	15·7	3·2	64·6	19·6
Remainder	12·9	4·0	47·1	21·5
North Midland	8·6	2·2	42·8	11·2
Midland	12·8	2·8	45·9	18·3
W. Midland conurbation	16·1	3·4	56·2	22·6
Remainder	9·5	2·1	36·6	14·1
Eastern	5·9	1·1	24·4	9·2
London and S.E.	9·0	1·8	40·5	12·3
Greater London	9·9	1·9	46·6	13·8
Remainder	5·9	1·3	24·5	8·6
Southern	5·4	1·3	25·7	8·7
South-western	6·4	1·4	25·9	10·3
Wales	12·2	2·4	46·9	18·5
Wales I	14·0	2·7	51·5	22·2
Wales II	7·6	1·8	37·1	11·4

Lancashire has the highest rate (20.8 per 10,000 men in the 45–54 age group), which is almost four times the rate for the southern region (5.4 per 10,000). How far this difference is attributable to geographical conditions and how far to urbanization it is impossible to say.

Urbanization has repeatedly been shown to influence deaths from chronic bronchitis, and the latest figures confirm previous experience. The highest death rate from bronchitis in both sexes and at all ages is experienced by those living in "conurbations." There is a progressive decline in the death rate with the size of the towns, and the lowest figures are found in the rural areas (Table V, Fig. 4).

TABLE V.—*Bronchitis and Degenerative Heart Diseases, 1950. Death Rates per 10,000. (Age 45–54)*

	Bronchitis		Degenerative Heart Disease	
	M	F	M	F
England and Wales ..	10·8	2·5	7·4	5·2
All conurbations	13·7	3·1	6·9	4·3
All conurbations excluding Greater London	17·5	4·4	9·1	6·1
Urban areas with population of 100,000 and over ..	12·2	2·7	7·8	5·7
50,000 and under 100,000	10·6	2·6	8·9	5·7
Under 50,000	9·5	2·3	8·3	6·1
Rural areas	5·5	1·3	6·8	5·3

The ratio of male to female death rates does not appear to vary much for the varying degrees of urbanization, but does differ between the different standard regions, the north-western having the lowest ratio 3.5, for age 45–64, with North Midlands very near (3.8), and, at the other end of the scale, London and Wales each with a ratio of 5.1 and the eastern region with 5.4.

"Degenerative heart diseases" do not show such a consistent fall in rates with a decrease in size of town, but those living in conurbations (excluding Greater London) have the highest risk and rural areas the lowest risk of dying from these causes (Table V).

Atmospheric Pollution

Stocks (1947) drew attention to the inverse relation that existed between hours of sunshine and bronchitis death rates. He pointed out that smokiness of atmospheres, the shorter day, and the excess of cloud are all cumulative and affect northern towns particularly. Attention has been drawn to the relationship between atmospheric pollution and death rates from respiratory causes in many papers, such as those by Mills and Mills-Porter (1948) and Herrington and Moriyama (1939), but in all these studies the areas with the worst pollution are also those with lower social and economic standards.

There is ample evidence that atmospheric pollution may be responsible for the deaths of many who suffer from

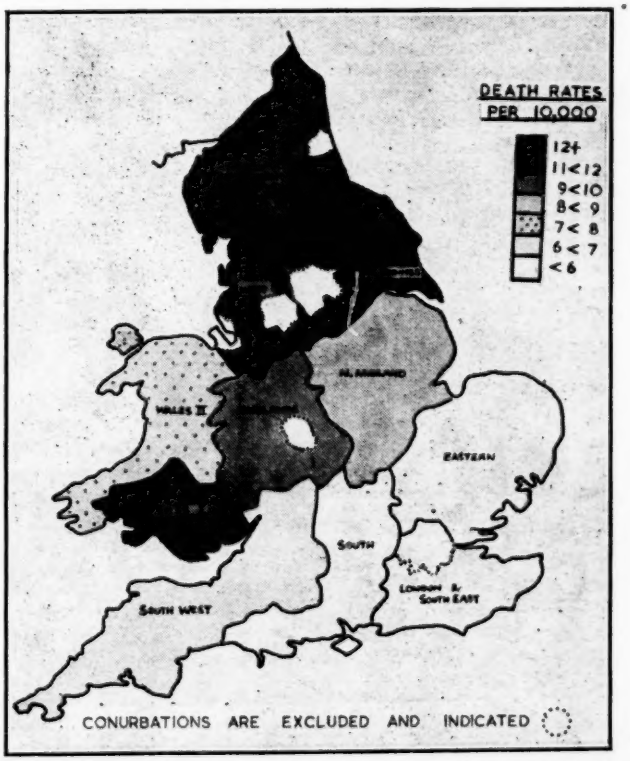

FIG. 3.—Bronchitis death rates in regions, 1950. Men aged 45–64 years.

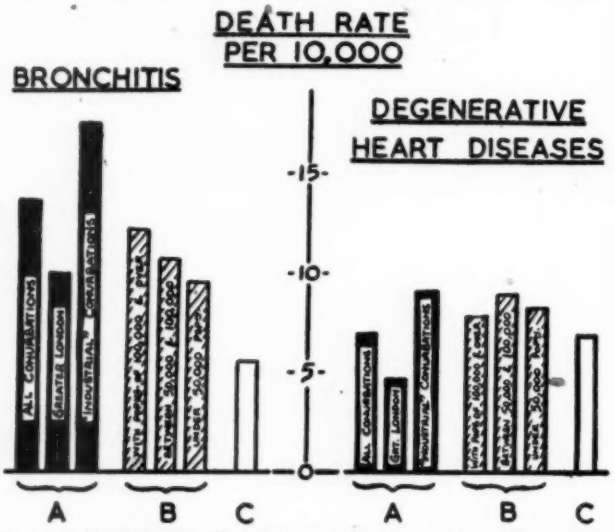

FIG. 4.—Distribution of deaths from bronchitis and degenerative heart diseases according to degree of urbanization, 1950. Men aged 45–64 years. A=Conurbation. B=Urban districts. C=Rural districts. ("Industrial" conurbations are: S.E. Lancs, Merseyside, Tyneside, W. Yorkshire, and W. Midlands.)

chronic respiratory and heart disease. The Meuse disaster in 1930 and the Donora Valley incident of 1948 are widely quoted. The extensive official report of the Donora episode shows that over 40% of a population of 14,000 were in some way affected, but that all but 1.7% were quite well within a week of the fog lifting. It was those who suffered from long-standing respiratory disease who were more likely to be killed or incapacitated for long periods. London has long provided examples of the results of the lethal nature of severe fogs, which may give a death rate of the same order as that experienced in the severest epidemics (*British Medical Journal*, 1953). The recent London fog was responsible for 6,000 deaths, most of which were in the age groups above 45.

It may well be that exposure to continuous but much less severe atmospheric pollution, such as is experienced in many of our large towns, contributes to the high death rate from chronic bronchitis of those who live in industrial towns, but no evidence is available which makes it possible to be certain of this point.

At the other end of the scale, the Scandinavian countries, with a dry atmosphere little polluted by smoke, record very few deaths from bronchitis. For example, in 1948 the death rates per 10,000 from bronchitis in these countries for the age group 50–60 years were:

	Males	Females
Norway	0·2 (5)	0·4 (7)
Sweden	0·4 (25)	0·2 (12)
England and Wales	17·8	4·5–

The actual numbers of deaths in the Scandinavian countries are given in parentheses.

The actual number of deaths were small in the Scandinavian countries, but when all respiratory deaths (excluding tuberculosis and carcinoma of the bronchus) were considered together there was still very little difference between Norway and Sweden or between men and women in these countries, whereas this country's rates were much higher (Table VI).

TABLE VI.—*All Respiratory Deaths (Excluding Tuberculosis). Rate per 10,000*

Age	Norway		Sweden		England and Wales	
	Men	Women	Men	Women	Men	Women
40–49	1·8	1·9	1.1	1.1	5·2	2·4
50–59	4·4	3·3	3·6	2·1	17·4	5·4
60–69	11·9	9·3	8·1	7·1	46·0	14·3
70–79	39·5	44·3	26·0	30·6	80·3	43·0

It is possible that deaths from chronic respiratory disease were certified as cardiac deaths in Scandinavian countries. Examination of the figures shows this cannot affect the relative positions to any large extent, as the rates for death from heart disease are lower in Norway and Sweden than in this country.

Occupation

(The latest figures are for 1930–2—that is, when there was some overlap between respiratory and myocardial causes of death. There is a significant correlation between the standardized mortality ratios for bronchitis and for myocardial disease for the different occupations, $r=0.68$; $P<0.0001$.)

TABLE VII.—*Occupational Distribution of Bronchitis Deaths, 1930–2. Males Aged 20–65. (All Males=100)*

Social Class III	Ratio	*Social Class IV*	Ratio	*Social Class V*	Ratio
Coal hewers and getters	170	Metal grinders	222	Costermongers, newspaper sellers	230
Metal moulders and diecasters	169	Road transport—horse-drivers	205	Messengers, porters, etc.	203
Furnacemen, rollers, etc.	163	Iron and steel foundry furnacemen and labourers	179	Water transport, dock labourers	199
Masons, stone-cutters	147	Coal workers, above ground	172	General labourers, etc.	187
Cotton-spinners	132	Coal—others below ground	143	General unskilled workers, etc.	176
Warehousemen, storekeepers	118	Textile dyers	140		
Salesmen of meat, greens, etc.	117	Coal—conveying to shaft	135		
Paper-hangers, painters, etc.	111	Sawyers and wood turners	128		
Boiler-makers, etc.	108	Coal workers below ground	126		
Hairdressers, etc.	107				
Boot factory workers (skilled)	103				
Boot-makers and repairers	102				
Tailors, etc.	100				
Cotton-weavers	97				
Bricklayers	94				
Smiths and skilled forge-workers	92				
Total of all in Social Class III	*91*	*Total of all in Social Class IV*	*124*	*Total of all in Social Class V*	*156*
Stationary engine drivers	89	Fitters' labourers, etc.	123	Builders' labourers, etc.	133
Fitters, mechanics, etc.	81	Metal machinists	111	Railway porters	117
Postmen and sorters	80	Coal workers—roadways	102	Other workers, navvies, in building	74
Domestic servants (indoors)	73	Boiler firemen and stokers	93	Agricultural labourers	52
Typists and other clerks	71	Platelayers	90		
Bakers and pastry-cooks	67				
Carpenters	65				
Road transport—motor-drivers	64				
Railway engine drivers, etc.	60				
Civil Service typists and clerks	54				
Gardeners, nurserymen, etc.	51				

The standardized mortality ratios for bronchitis for different occupations are given in Table VII. Owing to the great differences between social classes the occupations have been grouped into their respective classes. Dusty trades were high on each list, and the figures for 1930–2 almost certainly will include cases of pneumoconiosis, which were not at that time diagnosed with the same accuracy as to-day.

Predominantly outdoor work does not seem to have an adverse effect. Gardeners, agricultural labourers, railway porters, builders' labourers are all below their own social class averages. Sutherland (1947) reached a similar conclusion. It must, however, be remembered that these figures are based on the occupation as given on the death certificate, which may not be the predominant occupation of the individual's working life. This was especially likely to apply in the 1930's. Moreover, the existence of chronic bronchitis may have driven men from work involving heavy physical labour either to lighter work or, more usually, to no work at all. The very high death rate from this cause among unoccupied males probably reflects this result of the disease.

II. SICKNESS

Little information is available on the incidence of sickness from chronic bronchitis. Inquiries made by the Social Survey in 1951 suggested that 16.5% of the total days lost from sickness by those aged 21 and over resulted from respiratory complaints* (this excluded 23% due to colds and influenza) (Table VIII).

TABLE VIII.—*Social Survey—Survey of Sickness, 1951. Total Days Lost Each Month. Age 21 Years and Over (4,000 Persons Interviewed Each Month)*

Month†	Males			Females		
	All Illnesses	Colds and Influenza	Respiratory Diseases‡	All Illnesses	Colds and Influenza	Respiratory Diseases‡
January ..	8,384	3,764	1,336	11,333	6,267	2,078
February..	6,546	2,671	1,137	7,669	3,038	1,635
March ..	5,077	975	1,185	5,094	1,311	990
April ..	3,941	329	820	3,529	378	470
May ..	3,487	238	630	3,116	230	334
June ..	2,484	99	245	2,944	80	318
July ..	2,831	63	289	2,505	88	204
August ..	1,414	27	205	954	63	37
September	1,173	53	110	1,440	143	184
October ..	2,732	238	300	3,534	576	440
November	3,664	317	663	3,506	433	640
December	3,453	458	690	4,317	624	1,016
Total ..	45,186	9,232	7,590	49,941	13,231	8,346
Total, incl Aug. and Sept. twice	47,773	9,312	7.905	52,335	13,437	8,567
Percentage of all illnesses		20	17		26	16

† Based on interviews in the two following months except for August and September, when, owing to the General Election, there were no interviews in October.

‡ For list of diseases included, see footnote on this page.

In a survey of illness in general practice Pemberton (1949) found that in Sheffield bronchitis was the commonest cause for which a doctor's advice was sought. In the eight practices examined it accounted for 13% of consultations in a week in winter and 7.6% in a summer week. Pemberton (1952) reported that in three Sheffield steel-works employing 9,970 men bronchitis accounted for 13% of all medically certified illness over the period January–June, 1949. In a factory in the Manchester area employing some 1,700 employees this percentage was 14.5. Using data from Raffle (1951), we estimated that 13,000 man years are lost annually in England and Wales from bronchitis.

Sex Differences

What little information there is suggests that the male mortality excess from this disease may not reflect its true sex incidence. In fact the Social Survey found in 1951 that of all days lost during the years through illness the women lost more through respiratory complaints than the men (Table VIII). The women seemed to have shorter and more frequent attacks than the men. For women not going to work the criterion of "days lost" is taken to mean the number of days on which they were prevented by the illness from going out of doors. These figures are open to criticism, since they are based on interviews in which information was sought about the illnesses and days of incapacity experienced during the preceding two months and the cause of such illness is that given by the informant.

In the Statistical Report of the Health of the Army 1943–5 (1948) it was found that in 1943–4 the percentage of A.T.S. admitted to hospital for bronchitis, when standardized for age, was higher than that for soldiers, whereas the percentage of cases requiring discharge from the Army was much higher for men than for women. This report dealt, of course, with a highly selected group of both men and women, but it comments: "This difference between discharge and morbidity sex differentials suggests that (*a*) the incidence of the more serious type of bronchitis—namely, cases leading to discharge—is higher among men, and (*b*) the reverse is true of the milder cases that do not involve discharge." Of all military discharges (category E) for 1943–4, 50% were due to bronchitis.

In a survey of respiratory illness in Corby in 1949, Sutherland and Wilson (1950) concluded that "the incidence of respiratory illness among women aged 15 to 44 was double that reported by men."

There is very little information on sickness among women over 45 years of age. Firms keeping records of certified sickness absence for men and women doing similar work find that women have from two to three times the men's rate, age being comparable, for absence due to bronchitis as well as that due to all certified sickness. It must be remembered that this is a comparison of sickness absence, and that economic and social conditions may make absence from work more necessary or perhaps easier for a woman than a man. It is difficult, however, to believe that these factors would change a two to three times male excess, as seen in the mortality figures, into a two to three times female excess for sickness.

Occupation

There is very little information on the effect of occupation on sickness due to bronchitis. Bradford Hill (1929) examined the sickness experience of printers from 1921 to 1925 as given by the records of approved societies, and in the next year he also examined similar figures for operatives in Lancashire cotton-mills for 1923–7, which was repeated 10 years later by Harvey (1939). The number of days' sickness per person per year from respiratory causes (excluding colds and respiratory tuberculosis) are shown in Fig. 5. This chart also gives the recent post-war experience

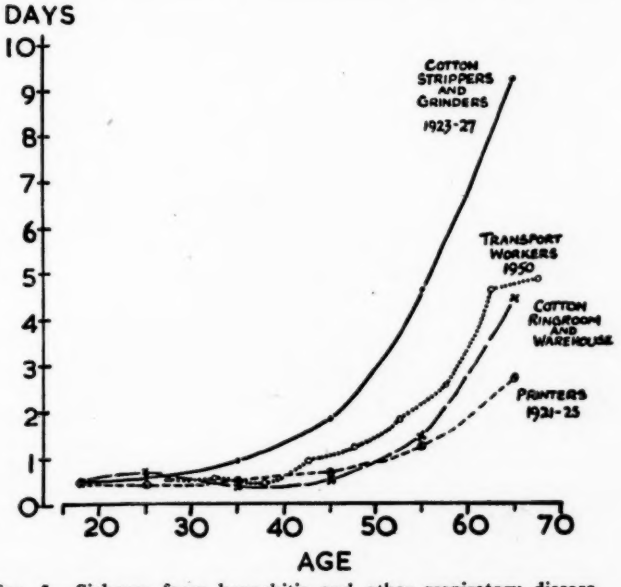

FIG. 5.—Sickness from bronchitis and other respiratory disease (excluding respiratory tuberculosis, colds, etc.) in males. Number of days' sickness per person per year. Printers and cotton workers from Bradford Hill (1929, 1930), transport workers from Raffle (1951).

of a group of transport workers (Raffle, 1951). It will be seen that those exposed to cotton dust (strippers and grinders) begin to show an increase in lost time from respiratory causes at a much earlier age than those not exposed to dust. It must be pointed out, however, that cotton dust is known to be irritating. Figures are not available to show the effect upon sickness rates of bland or inert dusts, though it has long been held that "dust which impairs the vitality of the lungs predisposes to tuberculous infection . . . and . . . to other respiratory disease" (Collis, 1923).

*Acute sinusitis; laryngitis and tracheitis; acute upper respiratory infection of multiple or unspecified sites; pneumonia; bronchitis; other respiratory diseases (excluding hypertrophy of tonsils and adenoids).

Disablement

The survey of registered disabled persons to which reference has already been made was carried out in four regions —London, Midlands, North-west England, and Scotland. In the north-western region not only was bronchitis the largest single disease group encountered (with the possible exception of skeletal conditions) but it accounted for more unemployment at all ages and social levels than did any other physical condition. In the sample of 1,184 drawn from this area there were 124 patients with chronic bronchitis of whom 24 (20%) were unemployed. The prospects of employment for men who were severely disabled by bronchitis did not appear to be influenced by the possession of manual skill—this was in marked contrast to general experience. Those with bronchitis who were unemployed at the time of the interview had often undergone a steady decline in social status since becoming disabled. The frequent winter exacerbations of their disease and the necessary long absences from work made them very uncertain employees. It was estimated that 42% of those with bronchitis were severely incapacitated for any type of work, whereas only 23% of the rest of the sample were disabled to a similar extent.

DISCUSSION

While the facts given above are of interest the reasons for them still remain obscure, and much of what follows is but surmise.

Sex Difference

The reason for the male mortality excess from chronic bronchitis is not clear, and is made more difficult to understand by the apparent excess of respiratory sickness among women. The observation that chronic bronchitis takes a more serious course in men is confirmed by Fulton (1953), who has found that in a series of deaths from cor pulmonale in a Manchester hospital over 90% were in men. This sex difference in bronchitis may be due to hormonal or other constitutional differences, so resembling rheumatoid arthritis and coronary disease in its predilection for a particular sex. The fact, however, that this difference is not observed in the Scandinavian countries may be an argument against such an explanation. It might, however, be explained by the different work habits of men and women. Comparatively few women work for long periods in cold, rain, fog, and dust. Nor is there the same economic urge for them to return too early to such conditions following acute respiratory infection. Physical effort carried out during or immediately after an acute respiratory infection may also be a factor in the different sex incidence. For the most part men of social classes III, IV, and V do heavier physical work than women. It is likely that this heavy exercise and the heavy breathing it induces may produce excessive stretching in lung tissue still abnormal as the result of recent infection. The fact that those conurbations where it is the custom for married women to go out to work show a lower sex difference than in those where most married women stay at home supports this hypothesis.

Smoking may also be a factor in producing this sex difference. In a series of 50 male patients with chronic bronchitis seen clinically in the north-western region almost all had been cigarette smokers. A number regard the predyspnoeic stage of their bronchitis as a "smoker's cough." Most of them had continued to smoke except during the more acute exacerbations of their disease, and many had ultimately to cut it down or give it up completely.

If these surmises are in fact correct, one might look for a narrowing of the gap between male and female deaths from chronic bronchitis in the next 20 years, first, because of the reduction in physical work required of the modern workman on account of increased mechanization; and, second, because the smoking habits of the sexes have undergone a change.

Social and Economic Factors

Many writers have emphasized the importance of social factors in the aetiology of chronic bronchitis. Overcrowding and cross-infection, malnutrition, and inability to treat early respiratory infections with enough care may all play a part. In most working-class homes it is impossible to treat a serious respiratory infection with the respect it deserves, and the cross-infection and re-infection that ensue among many of these families is familiar to most general practitioners. Douglas (1951) found that lower respiratory tract infection in the first six months of life was four times as great in the infants of manual workers as in those of professional and salaried classes, and he attributes this to "the general pattern of their living as well as their home conditions."

The greatly improved nutrition of the children of social classes IV and V, and the remarkable reduction in overcrowding reported by the Registrar-General (1952) in all our slum areas, may do something to reduce the excess of this disease among these social classes in the future.

Urbanization and Location

It is difficult to separate the effects of socio-economic factors and those due to urbanization and location. Living in a town involves more opportunities for cross-infection during entertainment and travel. It is not unlikely that pollution of the atmosphere from small amounts of coal dust and sulphur dioxide has an irritating effect on the respiratory tract. There is no doubt at all that smoke associated with fog has a serious effect on the elderly and the chronic bronchitic in precipitating a mortal bronchopneumonia. Part of the excess of deaths in the poorer classes may be accounted for by their living in a more heavily smoke-polluted atmosphere.

It is not easy to be sure of the importance of location, because the industrial towns, with their crowding and heavy atmospheric pollution, happen to be situated very largely in the north and west. It is true that the rural areas of the north and west show higher figures than the rural areas of the south and east, but this may be due to contamination from nearby industrial areas. It seems probable, however, that the humidity of these parts, particularly when it is accompanied by smoke, has a bearing on the incidence and course of chronic bronchitis in the north-west. The strikingly low mortality rate from this disease in the Scandinavian countries, where a much drier as well as cleaner atmosphere is enjoyed, supports this view.

Disablement

The serious nature of this disease is shown by the high incidence of disablement among its victims. At a comparatively early stage they may become incapable of heavy physical effort, and winter exacerbations make them unreliable workers throughout the winter months.

Little can be done to help the patient with established emphysema, and any hope lies in prevention. While the social and occupational factors are slowly being mitigated it would seem that the general practitioner has an important part to play in reducing this disablement. The modern range of antibiotics have provided him with a means of giving effective treatment for the acute respiratory infections, and the National Health Service has made the full treatment of these conditions freely available to everyone. It would also seem to be important to persuade the man whose job involves heavy physical effort or exposes him to fog, cold, or dust to delay his return to work until his chest has fully recovered from acute pulmonary infection. By such measures fewer bronchitics may pass into the chronic stage and their deterioration may be retarded.

CONCLUSION

For many years this crippling disease has been complacently accepted, and the "cough bottle" has been one of our national institutions. The problem is one of great complexity. A logically planned attack upon it cannot be made until more is known of the weight to be given to various aetiological factors. Further investi-

gations planned to throw light on the different incidence of the disease in the two sexes might give a useful lead in such a study. Long-term studies of the natural history of the disease are already in progress and are likely to give information on the importance of certain occupational factors.

It is certain, however, that the problem is too difficult to be solved by a piecemeal approach. What is needed is a well-planned and co-ordinated attack by experts from various fields. Quite apart from humanitarian consideration, the economic loss resulting from this disease calls for immediate action.

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THE PLACE OF THE HOSPITAL IN A NATIONAL HEALTH SERVICE*

BY

Sir ALLEN DALEY, M.D., F.R.C.P., D.P.H.

Administrative Areas

Our next problem in a combined service is the areas to be covered and the populations to be served. Many think that there are too few regional hospital boards and that the original conception of between 30 and 40 would have been better. This might have avoided the expensive administrative set-up of hospital management committees and also have avoided the friction which tends to develop between the boards and the management committees. There are, however, obvious advantages in linking hospital boards with teaching hospitals, though some may say that the disadvantages outweigh them. The location of the university medical schools, placed where they are for entirely different reasons than to be the nucleus of a national health service, certainly caused grave difficulty when the boundaries of the 14 regional boards were being settled. It is clear that if there were a combined service a much larger number of areas than 14 would be needed. There are 145 local health authorities and about the same number of executive councils. In any organization of a combined service, the hospital areas would have to coincide with those of local authorities, many of which would have to be associated with their neighbours for the purpose of making an adequate area for hospital planning—generally regarded as one to serve at least one million people. This coincidence of boundaries of responsibility would in itself greatly facilitate co-operation between the hospital services and those of local government.

It is the dream of many to restore hospital provision to local government. With salaries and conditions of service for hospital staffs fixed centrally and specific regulations made concerning the method of appointment of consultants, the main objections to this are not nearly so strong as in the past, but, without ruling it out, I will not discuss it further, as it hinges on the relationship between the finances of central and local government and on a complete reform of the boundaries of local government areas, involving inevitably the disappearance of many of the smaller local authorities. The emotional reaction to any such proposal is infinitely greater even than that evoked when it is proposed to close a small hospital. Parliament is unlikely, in the foreseeable future, to tackle such a thorny and controversial subject.

My conclusion, therefore, on the questions of a combined service, and whether it should be administered by nominated or elected bodies, is that the practical difficulties of making any radical change, particularly at this stage, are insuperable, but it is not beyond the realm of realism to go back to the "Willink" proposals so far as the number of hospital boards is concerned, and this would ensure a much closer association with the other two branches of the service—the local authorities and the executive councils.

Why Does the State Charge Itself with the Cost of Hospitals?

In the meantime, it behoves us to look again at the administrative structure as it exists to-day and try to determine what is the proper function of a hospital in a national health service. In the first place, we must remind ourselves that Governments do not pour out vast sums of money because they are sorry for sick people. They do so because there is a national insurance scheme which pays out money to people who cannot work because of ill-health and to the dependants of those who die, and also because the Government needs for the well-being of the nation, in peace or in war, the productive capacity of all its nationals who are able to work.

The first National Health Insurance Scheme provided from 1913 a general-practitioner service for insured persons. It was for the dual purpose of providing treatment so as to get the insured persons off the funds and back to work again as soon as possible and also to provide responsible certifying officers for sickness and disablement benefit. Sir William Beveridge, as he then was, said in effect in his report of 1942 (Beveridge, 1942) that if his scheme, which provided larger benefits, was to be successful a comprehensive medical service available to all, free at the time the service was needed, was essential. The link, again, is with the payment of cash benefits.

The objectives of the Service are, primarily, to maintain the health of the community, to prevent disease, and to restore to good health as soon as possible all those who fall ill. That the Service also relieves suffering and prolongs the life of the aged is incidental, as, collectively, whatever their private feelings, Governments, as such, are not sentimental.

Prevention of Illness and Speedy Restoration to Good Health

The insistence on prevention of illness and a speedy restoration to good health of those who fall sick as a major responsibility of a national health service is no new idea of my own. It is the thread running through the recent book

*The second of the Croonian Lectures delivered before the Royal College of Physicians of London on July 9.

of Sir James Ross (1952). Even in the training of nurses the Working Party reporting in 1947 (Nurses, 1947) stressed the need for giving more attention during training to "modern ideas of social and preventive medicine." The British Medical Association (1930) in its proposals for a general medical service for the nation gave as the first of its fundamental principles "that a satisfactory system of medical service must be directed to the prevention of disease no less than to the relief of individual sufferers."

Owing, no doubt, to the inadequate attention paid in the past to the importance of preventive medicine in the training of the medical undergraduate, there is a tendency among many workers in the clinical field to take little or no interest in preventive medicine or, if they think about it at all, to leave it to "the public health people." I shall endeavour to show that it is the bounden duty of every doctor, particularly those working in a national health service, himself to participate in the practice of preventive medicine so far as it relates to his own patients, and that without the close co-operation of those whose major interest is curative medicine the preventive medicine specialists cannot do their job properly.

Hospitals and Preventive Medicine

There is a considerable body of support, particularly in the U.S.A., for hospitals taking a more active part in preventive work. Dr. Stanhope Bayne-Jones (1949) said "hospitals should become increasingly houses of prevention instead of houses of pity." He quotes the report of the Committee of the New York Academy of Medicine on "Medicine and the Changing Order," published in 1947, to the effect that "the whole perspective of hospital care should be enlarged to include preventive as well as curative care." He lists a number of special activities of a preventive nature which hospitals should provide. They include diagnostic and consultation clinics available to all, clinics for periodic health examinations, and child welfare and child development clinics. He also quotes Corwin, who wrote in 1946: "Hospitals and their out-patient departments are increasingly being looked upon as strategic centers for all health service activities."

The late Viscount Dawson wrote in an American book (Bachmeyer and Hartman, 1948) on hospitals: "For 25 years or more the idea has been spreading that the practice of medicine should be occupied not only with those disabled by sickness or accident but also, if not primarily, with the building up of health, and that for the extended purpose our medical services have become too haphazard and incoordinate in their arrangement. In other words, organization has not kept pace with ideas."

Writing in the same volume, Dr. James A. Hamilton, the then President of the American Hospital Association, says of his own country: "This disjointed conglomeration of health agencies is uneconomic, duplicating, and wasteful. The high quality of medical care cannot be maintained and the volume of health services cannot be adequately extended to the great mass of the people if such isolationism is allowed to continue in its present form"; and Dr. I. S. Falk, after pointing out that, with our present lack of knowledge, most sicknesses and most deaths cannot be controlled in the sense of preventing their occurrence, says: "These diseases which we cannot wholly prevent need early detection and accurate diagnosis and the patients need prompt and comprehensive care. . . . The principal import of these contentions is that medical care must be regarded as an integral part of a broad programme of public health."

Boudreau (1934) says: "It is in the out-patient department that the closest approach is made to incipient disease, and it is here that the somewhat arbitrary distinction between curative and preventive medicine loses its force." But he adds that "a hospital cannot function properly as an instrument of prevention unless its staff knows, lives, and breathes in an atmosphere of prevention," and "the hospital must be integrated with all the other health services of the community, which should fit together and be adapted and regulated to each other like the wheels of a watch. . . . It must be fitted into the community; the community cannot be changed to suit the hospital."

Sir Arthur Newsholme (1932) says: "The history of hospitals is one first of care for the sick, then with advances in medicine and surgery, of increasing care, and lastly of prevention. The last stage now overlaps with the needed care and cure."

A more recent writer, Professor H. W. C. Vines (1952) says: "Apart from the curative treatment of the already ill, the acute hospital, as part of the local community, should now be developing a functional part in the prevention of disease as in the more distant future its activities may have to be considerable." At the recent International Hospital Congress he developed this theme and said: "The real future of the hospital service may well come to lie not in the wards but in the polyclinics, and it is these which must gradually become the major centres of practical preventive medicine."

Dr. Malcolm T. MacEachern (1935) lists the four primary functions of a hospital as: (1) care of the sick and injured; (2) education of physicians, nurses, and other personnel; (3) prevention of disease and promotion of health; and (4) advancement of research in scientific medicine. He adds, "In the out-patient department especially, there is an extensive field for the teaching of hygiene, an opportunity which should not be neglected. The hospital should take leadership in educating the public individually and *en masse*." Dr. Edwin Crosby puts number three rather differently when he says (International Hospital Federation, 1953) that one of the functions of a hospital is "to foster and promote the public health and preventive medicine programs of the community."

The Commission on Hospital Care in the U.S.A. (1947) reported that "general hospitals should co-ordinate their efforts with those of other community agents concerned with the prevention and treatment of disease, and, when conditions permit, the general hospital should serve as the focal point through which the health service of the community is integrated. . . . Hospitals should participate in community-wide educational programs, thereby assisting the public to obtain a full understanding of the importance and methods of obtaining a high level of health. . . . Hospitals and health departments should co-ordinate their efforts and integrate their functions. . . . There should be a close relationship between hospitals and public health departments so that the educational activities can include training in public health work. . . . However, the gap between curative and preventive medicine is constantly narrowing. It appears important for the physician to give more and more of his attention to preventive measures and to the maintenance of the health of his clients. . . . The public health department is the logical agency to direct such programs. . . . But, physicians, hospitals, and public health departments should pool their efforts by integrating the functions of preventive and curative medicine in order to serve more effectively the health needs of the whole population."

It is striking that these expressions of opinion come mainly from the U.S.A., where the provision of medical care is still regarded as a matter for the private individual and not, as here, a public responsibility.

Interest in the Subject

It is an indication of the great interest now being taken in this subject that, at the Eighth International Hospital Congress just held in London and attended by representatives of over forty nations and from whose transactions I have already quoted, the central theme was "preventive medicine as a major function of the hospital and its implications."

The above quotations may lead some to the thought that the hospital should become the centre of gravity of the preventive health services, and it is well, therefore, to note

some opinions to the contrary. For example, Dr. Van den Berg, a representative of the World Health Organization, said (International Hospital Federation, 1949): "Hospitals should concern themselves with the treatment of patients and it is difficult to combine this with the direction of preventive measures as a whole. . . . But, preventive and curative medicine are connected. . . . They blend in fact. . . . Much curative treatment is . . . a part of secondary prevention: that is to say, in which the object is not to prevent disease but to ensure that an existing disease is not aggravated and does not cause permanent illness or mental incapacity. . . . Hospitals play an important part in this extensive field of secondary prevention and, although, in my opinion, they cannot form the centre of the health organization on the one hand, on the other, they cannot lose their touch with it entirely." At the same congress Dr. Charles Maitland (England) said: "We must not regard hospitals as institutions that can be expanded indefinitely. We must ask, Why are people in hospitals and need they be there?"

Again, Miss Florence Nightingale (Cook, 1913) is recorded as saying "that hospitals are, at best, only a necessary evil: a necessity, as someone has said, in an intermediate stage of civilization. The secret of national health is to be found in the homes of the people."

Finally, Sir Andrew Davidson (1952) said: "My considered opinion is that the emphasis must be on the domiciliary health services through the co-operation of the family doctor and the health service of the local authority. The rising cost of hospital care—if nothing more—is forcing more attention to be paid to the preventive health services." Dr. G. E. Godber (International Hospital Federation, 1953) said: "It is not the specialized hospital services which should control the others, rather it is the needs of the others which should largely determine the form which hospital services should take." And, he added, "The medical officer of health, who is the most valuable co-ordinating influence in the whole health service, should be confident that in the hospital he has an ally, second only to the family doctor."

The above quotations, and they are but examples of many more, have been introduced to make it clear that during the past few years many people both here and in America have been thinking about the future of hospitals and the part they should play in promoting good health and preventing serious disease.

Hospital Costs

With the increase in scientific aids to diagnosis and advances in techniques of treatment, hospitals require more staff of all grades, and hospital maintenance costs, as already mentioned, are rising. Staff salaries tend to increase and hours of duty to decrease. In the U.S.A. and in Australia nurses now work 40 hours a week. In considering the place of the hospital in a national health service the question of the actual cost of the hospital section of the service and its relation to the total cost of the whole service become important. The last figures published for the whole service are for the financial year 1950–1 (Ministry of Health, 1952). I have rounded the figures to the nearest thousand.

	Thousands £	% of Total
Hospitals: capital	11,123	2.9
,, maintenance	213,483	55.0
General medical services	42,072	10.8
Pharmaceutical ,,	34,810	9.0
Dental ,,	40,337	10.4
Ophthalmic ,,	19,572	5.0
Local health authority services (50% grant)	15,621	4.0
Other	11,261	2.9
	388,279	100

The actual costs for some of the services for 1951–2 are now available (Accounts, 1951–2). The expenditure on hospitals, on both capital and maintenance, is slightly lower than in the previous year. Pharmaceutical costs rose by over £10,000,000; those on dentistry fell by nearly £9,000,000, and on ophthalmic services by nearly £11,000,000. Medical services cost the same, but the Danckwerts award of some £10,000,000 a year, apart from arrears, had not been implemented until after the financial year. In 1950–1 the local health authority services cost public funds double the figure given above, which is the cost to Government funds. The other half is found from the local rates. I am confident that argument will never cease on whether or not the allocation of the total budget is in the best interest of the community, and I do not propose to enter the lists, though many will, no doubt, soon be jousting before the Guillebaud Committee. But perhaps I might add the words of the cynic, "Extravagance is other people's expenditure."

Other Preventive Activities of Local Authorities

For the reasons set out earlier it is impossible to calculate an accurate figure showing the proportion of the total bill for the National Health Service which is devoted directly and entirely to the prevention of disease, but there is no doubt that it is small compared with the total cost of the Service. It must also be mentioned that many quite costly services provided by local authorities under the Public Health, Housing, and Education Acts are important contributions to preventive medicine and are not contained in the accounts of the National Health Service. These other services include sewerage and drainage, provision of healthy homes, pure water, collection and disposal of household refuse, open spaces and playing-fields, pure food, safe milk, prevention of atmospheric pollution, health education, the school health service, and the work of sanitary inspectors in connexion with the control of infectious diseases. Expansion of the services for promoting the health of factory, shop, and office workers would also not be a charge on the National Health Service, but would undoubtedly pay dividends in promoting community health. The effect on health of full employment and better national nutrition must also be mentioned.

Function of the Hospital

We are now in a position to examine more closely what hospitals do, what they ought to do, and their exact place in a national health service. I think it will be agreed that their primary function is to diagnose and treat the sick. But some provisos are needed even here. They should not usurp the position of the general medical practitioner. They should be consultative for him, and patients should not be asked, or even allowed to continue, to attend an out-patient department or be admitted for in-patient treatment if the treatment can be given at home by the family doctor and the home circumstances are suitable.

Training.—But hospitals have other important functions, including the training of doctors, nurses, midwives, and medical auxiliaries of all kinds. Teaching hospitals for medical students are in a special position with regard to the admission and retention of patients, as students must be taught the ailments, both common and serious, met with in general practice. Maybe the best way to do this is to include during the undergraduate training a short period of preceptorship with an approved general practitioner. This is probably better than admitting patients who need only general-practitioner care to teaching hospitals, but undoubtedly the range of patients dealt with in a teaching hospital in both the out-patient and in-patient departments must for these reasons be much wider than if the need for hospital, as distinct from family doctor, care were the only consideration. There is an increasing tendency both in this country and in the U.S.A. to devise better methods for preparing medical undergraduates for general practice.

Care of the Sick.—I have been considering up to now the acute general hospital, whose primary concern is, and always will be, the care of those who are seriously ill, though, as discussed earlier, it has important preventive functions. But the majority of the hospital beds in this country are not in acute general hospitals but in special hospitals of all types.

Planning Hospital Services

The regional hospital boards are the planning authorities for all types of hospital, except teaching hospitals, and general practitioners and public health officers, because of their special interest in, and knowledge of, the problems concerning those whose needs are best met in special hospitals, should be more closely associated than in the past with these planning functions. These classes of patient include not only those whose admission to hospital is needed because of their home conditions and not because they are in need of specialist care, but also the chronic sick, the "fever" case, the tuberculous, the long-stay cases in children, the mentally defective, and the mentally disordered, including the mental observation ward case, to mention only some examples. Only by associating at the planning stage those vitally concerned in the other two branches of the Service can full integration be achieved and the needs of all sick people met.

Integration with General Practice

With lessened house room, more women working in industry, and perhaps a greater reluctance of young people to care for their aged relatives at home, more accommodation is needed, so that general practitioners can admit patients to hospitals where they will continue to be under their own care; and some of these hospitals should be used for the instruction of medical students. Hospitals, too, have a responsibility for providing the means by which the knowledge of general practitioners can be kept up to date. There are various ways by which this may be done, and it involves not only close co-operation by reports sent to hospital with patients and the prompt dispatch from the hospital of notes on his discharge, but making the general practitioner feel that he is a welcome and essential member of the combined team of doctors, some working inside and some outside the hospital, engaged in caring for the sick of the district.

This leads to a regret that the former "district" hospital with direct responsibility for the sick of their defined district is disappearing, with the result that the patients who are less interesting from the purely medical point of view have more difficulty than in the past in obtaining a bed. It is all to the good that no meticulous inquiry about where he lives need now be made before a patient is admitted; but when patients, whose need of admission to a hospital is clear, are refused at their local hospital and that hospital takes no step to secure their admission elsewhere, the pendulum has swung too far.

Before 1948 the publicly maintained hospitals each had a definite district for which they were responsible, and if they could not themselves make a bed for an urgent case it was the duty of an officer of that hospital to find one himself in another public hospital. It is a disconcerting fact that in some 10 to 15% of the applications for beds made to the London Emergency Bed Service a bed cannot be found immediately, and the name must go on a waiting-list, sometimes for a considerable time, and occasionally the patient is dead before a bed can be offered. When a bed is offered it is sometimes miles away from the patient's home, involving extra ambulance costs, and cost and inconvenience to the patient's relatives. This type of waiting-list is apart from the waiting-lists to which we have become accustomed for "cold surgery" and for non-urgent medical cases to which the same objection cannot be taken, though complacency about this and taking the easy road that we cannot do anything about it unless we open or build more beds is to be deplored. One would ask what steps are taken to divert them to a hospital where the waiting list is shorter. Do we not, instead, take a pride in the length of our waiting-list as a tribute to our skill and popularity?

The hopes of those who maintain that the future of general practice lies in group practice from the health centres envisaged in the National Health Service Act and in the report of the Medical Planning Commission sponsored by the British Medical Association (Medical Planning, 1942) are not being realized because so few centres are available. The idea is still in the experimental stage, and it would be of great value if two or three such centres were placed each within the curtilage of, or immediately adjoining, a general hospital. By this method, the prospect of bringing together hospital, general practitioner, and public health clinic services might really be achieved for that locality.

The Chronic Sick

Questions concerning the chronic sick and the aged and infirm loom large in any national health service. It was given close attention by the local authorities when they were responsible for the public hospitals. Fortunately, many leaders of the profession are now also becoming interested in the problem (British Medical Association, 1947, 1948). It is realized that much can be done to prevent deformities, to restore the bedfast to ambulation and, in some cases, to their homes. The day of the large hospital for the "chronics" has, I hope, passed. All general hospitals, including teaching hospitals, should use a proportion of their beds for the more chronic type of patient "for thorough examination, and whenever possible they should provide treatment with a view to the patient's return to a useful life." The last few words are a quotation from the Goodenough Report on Medical Education (Medical Schools, 1944). When further active treatment is likely to be unavailing there should be an adequate number of "half-way" houses or "rest homes."

Again, there should be a closer association between the homes for the aged, administered by the welfare departments, and the geriatric departments of the hospitals. The geriatrician who has worked hard to restore a patient to ambulation should continue to supervise that patient even after transfer to a home for the aged. This need not interfere with the responsibilities of the general practitioner on whose list the patient is.

The senile patient who is confused in mind presents a special problem. He should not be relegated, as a certified patient, to a mental hospital but dealt with, as recommended by the Ministry of Health in a recent circular (Ministry of Health, 1950), in accommodation specially provided for this type of patient. The basis is for the patient to be investigated in a short-stay psychiatric unit in a geriatric department. For many the subsequent destination will be a long-stay annexe. Some of these may be detached buildings in existing mental hospitals but with a distinctive name and a separate entrance. They would no longer be a part of the mental hospital proper, and procedure under the Lunacy and Mental Treatment Acts would be unnecessary.

Special Hospitals

The needs of special hospitals are apt to be overlooked in the more spectacular and in many ways more satisfying work of the acute general hospitals. Mental hospitals and institutions for the mentally defective form the largest number. Though these hospitals and institutions, because of their size, the need for extensive grounds, and the statutary requirements for safeguarding the liberty of the subject, must be separated physically from other hospitals and must be, for all purposes, under medical control, yet the isolation of their staffs from the stream of current medical thought, which was common a generation ago, must be removed. A satisfactory feature of the new scheme is that it brings mental and general hospitals, and their staffs, more closely together. The increasing extent to which the staffs of mental hospitals act as consulting psychiatrists to the in-patients of general hospitals and take psychiatric clinics there and, in return, the consulting staff of the linked hospital or hospitals visit the mental hospital to advise on special cases of physical ailments, is a welcome development.

The objective should be for the same team of psychiatrists to be responsible in the linked hospitals for (1) con-

sultative work in the general hospitals, including psychiatric clinics; (2) mental observation ward work; and (3) work in the mental hospital itself.

There is little to be said about institutions for the mentally defective. It is open to argument whether there should be classification by institutions or within institutions. In the very large service with which I was formerly associated it was found to be advisable to have separate institutions for the higher-grade defective, but this is not possible everywhere. As a result of the deplorable lack of institutional accommodation many defective children have to wait long periods for a bed, with devastating consequences on the other members of the family. Mental illness is a great burden on the community, and little progress has been made in devising means for preventing mental ill-health, dealing satisfactorily with the incipient case, or preventing relapse. When sound methods are found, their application will no doubt involve close co-operation with the local health authorities.

There are many sanatoria and hospitals for the tuberculous. Though the death rate from tuberculosis is happily now declining, these special institutions are likely to remain in use for many years as more and earlier cases are being discovered. There is also an increase in the length of treatment required for the established case. There is no doubt that, when the glad day comes that all the beds available are no longer needed for the tuberculous, good use will be made of the accommodation. It is important that each physician in charge of a chest clinic should have beds at his own disposal and not simply be an out-patients physician. These beds should be in local, or district hospitals.

The incidence of the acute infectious diseases has fallen spectacularly in recent years. We cannot, however, be certain that this will continue. The virulence of the streptococcus, which was low in the days of Sydenham, high at the end of the last century and the beginning of this, and low again now, may be enhanced, and, though modern therapeutics are now available, more beds may some day be needed for scarlet fever. Many more beds are required now for acute poliomyelitis than was the case before 1947, and no one knows what new communicable diseases may appear. But, at least for the moment, the beds in the large fever hospitals cannot be filled. The small independent fever hospital cannot be justified as a separate entity. The present trend is to use large fever hospitals for other purposes but to retain a small section in single-bedded cubicle wards for such acute communicable diseases as arise. If well managed, there is, with one exception, no reason to fear the spread of infection to other wards. The exception is smallpox, for which special provision is essential. The earmarked accommodation must always be ready to be opened and a well-vaccinated staff be on call.

With increased facilities for air-borne travel, Oriental smallpox of a virulent type is an ever-present menace. The greatest danger is the patient with the disease highly modified by previous vaccination and with an immunity which is just fading. It is not creditable to the hospital service that within the last three years eleven members of hospital staffs have died of smallpox (Glasgow, 1950; Parker, 1952). That such unfortunate events can be prevented is shown by the experience of the Metropolitan Asylums Board and the London County Council, which dealt with thousands of cases of this disease, sometimes in epidemics, sometimes in sporadic cases, without any of the hospital staff ever being infected. But disaster is averted only by constant vigilance.

A Statutory Duty

Looking at the infectious diseases problem as a whole, there is a statutory duty to notify such cases to the medical officer of health, and he must take such steps as are practicable to control the spread of these diseases. Clearly he cannot act without knowledge of the cases, and it is highly unsatisfactory that, in a sufficient number of cases to be alarming, individual hospitals fail to bring in the local medical officer of health when there is infectious disease among patients or staff (Ministry of Health, 1953). As recommended by the Central Health Services Council and the Ministry of Health, the local medical officer of health should be a standing member of the committee, which every hospital is asked to set up, on cross-infection. Not only will this be of great value to the hospitals but it will ensure, by collaboration with the hospital staff, that his own knowledge of infectious conditions is kept up to date. This is specially important now that so many medical officers of health who were in charge of fever hospitals have been displaced.

Other special hospitals do not present the same problems of relationship to the other branches of the National Health Service, but there is the question of their relationship to the hospital service as a whole. In hospital centres, with many general hospitals, there is a place for the large special hospital—for example, for children, neurology, urology, eye diseases, ear, nose, and throat diseases, skin diseases, etc.—to which the specialists concerned from the units of the general hospitals are also attached. Such a hospital can be a centre for the training of specialists and a spearhead for research; apart from that, it is probably better not to have small special hospitals, but to have adequately staffed and equipped departments in the general hospitals, where all the laboratory and other resources are available and where consultants in all other specialties are to be found. If we could start *de novo* the ideal would be to have a large general teaching hospital with the various special hospitals grouped around it and with the "hotel-keeping" and business side under the same general administration.

Maternity

The provision of maternity beds presents a special problem. As explained previously, all three branches of the National Health Service are intimately concerned in maternity work. The trend is for women to prefer institutional to domiciliary confinement, and in one American city it is reported that 99% of the confinements occur in hospital and the other 1% in taxicabs. But in this country we are far from the stage when a bed in a maternity unit is available for every woman who would like to have her confinement there. If such beds were there, and used, the practice of the domiciliary midwife would disappear, and unless general practitioners were given access to a much higher proportion of maternity beds than at present there would be little midwifery for him to do.

A solution might be to reserve the beds in units or hospitals, staffed by specialists, for the abnormal case and for those normal cases required for the training of medical undergraduates and pupil midwives, and to deal with the other normal cases either at home where the domestic circumstances are suitable or in hospitals or homes where women could be attended by general-practitioner obstetricians or general practitioners of their choice. There would still be a place for the municipal clinic for intermediate antenatal supervision and for group instruction, including antenatal exercises.

The Clinic Doctor.—Speaking of clinics, the hospitals, so long as whole-time local health authority medical officers continue to take clinics, should make provision for antenatal clinic doctors to take some part in the work of the hospital so that their knowledge will be kept up to date. Similarly, the doctors who take infant welfare centres and work in the school health service should exchange duties with hospital staff to their mutual benefit. In several London hospitals, senior registrars from paediatric departments take infant welfare clinics while the clinic doctor attends at the hospital to do his work. Thus there is a real marriage of preventive and curative work.

Children's Long-stay Units

Another instance of the need for co-operation of the hospital service with other authorities occurs in the case of children whose stay in hospital is likely to be prolonged.

It is a great misfortune for a child to have a serious illness, but it is doubly unfortunate if, as a result of a long stay in a hospital, he is further handicapped by loss of education. It is therefore most important that arrangements be made with the appropriate education authority for teachers to be provided for all children whose convalescence, or even treatment, is likely to be prolonged. A similar problem exists in the adolescent or young adult who is preparing for an examination. Correspondence courses can often be arranged. For others, diversional or occupational therapy is increasingly supplied and should be encouraged.

Pathology and Radiology

There is little to be said about pathological and radiological aids to diagnosis. It is, however, interesting to recall that these were the great lacks when the L.C.C. took over the municipal hospitals in 1930; and I understand that the same was noticed when hospitals throughout the country, and in the small voluntary as well as the municipal, were used during the war as part of the Emergency Hospital Service.

For the smaller hospitals it is probably better to cover their laboratory needs by including them in a group with a group pathologist in charge and having on his staff experts in the subgroups—morbid anatomy and histology, haematology, bacteriology, and biochemistry—rather than expecting one man to cope with all the requirements. But the importance of close association between the clinician and the pathologist cannot be overstressed. If staff and money were available there should be an all-rounder primarily responsible for each small hospital with experts from a group or reference laboratory available.

Radiodiagnosis is not yet so highly departmentalized as pathology now that radiotherapy has separated from radiodiagnosis. The question has arisen whether or not radiodiagnosis should be provided in health centres for group practice, and general agreement has been reached that, provided there is a hospital with good radiodiagnostic facilities reasonably near, there is no need to provide it actually in the health centre.

These two departments, laboratory and *x*-ray, concern intimately another branch of the National Health Service—namely, the general-practitioner service. They are essential to his work. An increasing number of hospitals now allow direct access of general practitioners to these departments without requiring their patients to attend the out-patient department and be examined by one of their consulting staff. The fears that the departments would be flooded out and unnecessary examinations called for have in most cases proved to be unfounded.

Special Units

In a national hospital service, as distinct from a number of independent hospitals, special units are needed. Examples are plastic surgery, neurosurgery, thoracic (including cardiac) surgery, and radiotherapy. Here, again, it is necessary to break down isolationism and induce the staffs of the hospitals in the "gathering ground" to send their patients. This is often a slow educative process and can be done best by demonstrations at the special units and by staff visits to the outlying hospitals.

A Hospital Service

And this, perhaps, is the place to emphasize what I regard as my main theme in these lectures, which is that we are now supposed to have a hospital *service*. It has collective responsibility for providing a casualty service, an out-patient service, and an in-patient service for *all* who need them. As a unit in that service each hospital has a responsibility to all who apply to it, provided that, apart from emergencies and casualties, they are sent by their general practitioners. It is not compatible with that responsibility to decline a patient and to take no further interest in him. If, for any good reason, a hospital is unable to provide for his particular needs, it should be regarded as a duty of the hospital to which he applies or more generally to which his doctor applies on his behalf, and which represents to the applicant the National Hospital Service as a whole, to take trouble to ensure that his needs are met within the hospital service of which they are a part, and not to leave it to "somebody else"—the general practitioner, the patient himself, the M.O.H., or the Emergency Bed Service—to find a place where his needs can be met. *Per contra,* local patriotism and the belief that one's own hospital is the best in the country are grand things, but they should not run, as they have been known to do, to the extent of declining to send a patient, however "interesting" and however much he would like to stay, to another hospital where there is a special unit for such cases. This is another aspect of the "service" conception.

Then there is the relationship of the hospital service as a whole and of its individual units to the other two branches of the Service. From what has been said before, I hope that it will be agreed that there would be many advantages if all three branches were under the same administration and if the areas and populations covered by all three were the same, but there is no immediate prospect of this. Moreover, it would involve two-tier administration and control: one covering the whole area for large-scale planning and probably for financial control, and the others with suitable readily accessible local headquarters for day-by-day administration. As the day for this is in my opinion far distant, it is a challenge to those working in the Service to try to overcome the weaknesses inherent in the present administrative structure.

The committee of the Central Health Services Council, already referred to, struggled for months with this problem of the proper integration of the three components of the Service, but had to be content with general advice about the formation at local level of committees representative of the three branches. A primary duty of any administration is to consider, like the doctor prescribing a new and potent drug, the side-effects of any action about to be taken. This Service is new and potent, and many of its side-effects were not realized at the time the dose was prescribed. There are, in fact, few hospital activities which do not affect at least one of the other two branches: often they repercuss on both. Obvious examples are the opening of maternity beds or the provision of a geriatric unit, of a convalescent home or a child-guidance clinic or more beds for the mentally defective. So the first essential is free trade in information and the giving of advance information to others likely to be concerned before definitive action is taken. And this applies not only to the hospital side but to the other two as well. Formal meetings are, however, not essential for this type of co-operation. It can be done quite well on the telephone, between the three or four people concerned, and they, in turn, can consult with those in their own administration who ought to be told and would have useful advice to give. In only a small proportion of the matters under consideration will a formal meeting and discussion be needed.

One handicap to this method of ensuring smooth working is the size of the areas covered by the regional boards and, in consequence, the large number of local authorities and executive councils covered, wholly or partly, by most of them. At hospital management committee level the difficulties are not so great except in the cases of hospitals and sanatoria taking patients from a large number of separate health authorities, but even there they could be overcome.

Research

Before I close there are three other matters I would like to mention. The first is research. When I had responsibility for a hospital service I attached great importance to this, and appointed two committees—one on the general hospital and the other on the mental hospital side but with cross-representation—to encourage research in every possible way, to give advice to those who sought it, and to provide

statistical help and equipment. The members were appointed by their colleagues, and among other things were able to collate the experience of different hospitals and compare the results of different methods of treatment of the same condition. It is to be hoped that, as time goes on, a similar type of organization will develop in the present hospital system. Now that the public purse has assumed responsibility for medical treatment, the State and everyone who contributes to its upkeep has an interest in reducing the size of the bill. This means that more and more attention must be given to the reasons why people need hospital treatment. This necessitates a real interest in the matter and the making of observations which can be pieced together.

Cholera was looked upon as an "act of God," and would probably have remained as such until the germ theory was enunciated but for the famous observations Dr. John Snow made a hundred years ago. His implication of the Golden Square pump and his deduction that cholera was spread by drinking contaminated water was the direct result of careful observation, and saved thousands of lives. The keeping and collation of adequate records is essential if isolated "observations" are to bear fruit. Also, it is important to know which diseases make the greatest calls on hospital services. It will be found in the case of many such diseases that we do not know, within present knowledge, how to reduce their incidence or even to catch the patients in the early stages of the disease, when, presumably, the prospect of shorter and more successful treatment is better.

Investigations of community health in different localities in the hope that the differences will point to the aetiological factors involved is possible in a national health service, and the opportunity should not be neglected. It involves close co-operation between clinicians, statisticians, and public health workers.

Rehabilitation and Convalescence

The two remaining points have much in common. They are the importance of rehabilitation and aftercare and of medico-social work.

The days are gone when a hospital ceased its interest in a patient when he was discharged and when the physician or surgeon who sought information about the health of his patients two or three years after discharge and published it was regarded as unusually enterprising. As mentioned earlier, the State is not concerned primarily with hospitals in their humanitarian aspects but because they are the machinery by which members of the State can be restored to working capacity and so reduce the cost to the State of supporting them in hospital or at home as non-working members of the community.

Rehabilitation or reablement schemes are therefore being developed, and training in new employments when this is needed. Here, also, is yet another illustration of the need for a hospital to co-ordinate its work with that of another body—in this case the Ministry of Labour.

The question of convalescent homes and of recuperative holidays needs to be re-examined. At present, convalescent homes, of which there are not enough, are the responsibility of the regional hospital boards and no charge is made to the patient. Recuperative holidays are provided by the local health authorities, who are required by law to make a charge. In practice, there is little difference in the clinical condition of those recommended. If the doctor, either hospital or general practitioner, thinks that a convalescent case will be admitted earlier through the local authority, he recommends a "recuperative holiday" unless active medical supervision and nursing care are essential. This artificial distinction should be eliminated and either hospitals or local authorities be charged with the duty of providing for both categories. A definite link, preferably under the same management, should be forged between specific hospitals and specific convalescent homes so that there may be close contact between the two staffs. Further, it should be made easier for general practitioners to get their patients away for convalescence.

Medico-Social Work

Lastly, there is the important question of medico-social work. Hospital almoners, as already mentioned, do excellent work. There is also a wide range of medico-social work done by health visitors and almoners of the local health authorities. By statute, local authorities are responsible for the provision of "aftercare" and for home nursing, and have the power, which most authorities exercise, to provide a home-help service. Through their various powers and duties, particularly in the maternity and child welfare and school health services, the local authorities possess a great store of information about economic and domestic conditions which can be placed freely and gladly at the disposal of hospital almoners. When hospital staffs and general practitioners really know the nature of the assistance which can be given by health visitors they find it invaluable and use it increasingly. The almoning and health-visiting staffs are complementary to each other, and great good can result from their acting as a team.

Summary

It is impossible to divide medicine into two compartments, preventive and curative. The interlocking is far too great.

The hospital is an essential part of a national health service, not only for the diagnosis, cure, and relief of illness, but for the prevention of illness. But the hospital is not the centre of gravity of the service any more than the general-practitioner service or the public health service is the centre of gravity.

The other two branches are equally essential, and any of the three will make a more effective contribution to the health of the nation if they work together as closely as possible, centrally, regionally, and locally; avoid any tendency to competition, rivalry, or isolationism; and listen sympathetically to suggestions, requests, or even criticisms which come from workers in the other branches.

There is only one National Health Service, not three independent components of it. It should, as a service, be founded on the basic need of preventing ill-health and reducing the number of people for whom in-patient care is essential. The ideal would be to administer the Service through one, and only one, local body, nominated or elected or a mixture of both, but the difficulties appear to be insuperable without a change in the boundaries of local government.

The individual hospitals must remember that they are part of a national *hospital service* with a collective responsibility for the institutional care of the sick.

The acute general hospitals are only part of the hospital service. The various special hospitals, including the mental hospitals, far outnumber in beds the acute general hospitals. The special hospitals perform functions which are absolutely essential to the welfare of the community and must receive their due share of money, staff, and prestige. The provision of hospital beds where general practitioners can attend their own patients must not be neglected.

Hospitals are primarily for the diagnosis and treatment of the sick, and for many illnesses they only can provide the necessary service. Their rising costs are a matter of grave concern. It is more important than ever before to ensure that they are used to the best advantage, that they play their part in the preventive services, and supply the "needs" of the other two branches of the Service.

The out-patient consultative departments, or polyclinics as they may be called, will probably play an increasing part in the development of the Health Service.

The hospitals, particularly those with attached medical schools and research institutions, are the spearheads of research, but a plea is made for associating with certain types of research the local medical officer of health, who is anxious to know the amount and nature of the sickness among the community which he serves. By observing "associations," as did Dr. John Snow, the causes, now unknown to us, of many diseases may be revealed.

Hospitals are the training-grounds for doctors, nurses, and medical auxiliaries. Though the training of doctors is a responsibility of the universities, and not of the National Health Service, the training given in hospitals should emphasize, by the work going on there, the interdependence of the three branches of the Service and how they work together.

I am most grateful to the College for giving me this opportunity of expressing my views on a subject which I regard as of paramount importance to the future of the National Health Service, a service which, if it does what is expected of it, will make a substantial contribution to the happiness and prosperity of the nation. I am grateful, also, to my listeners for giving me so much of their time; and to the many, too numerous to mention individually, who have helped me with advice and suggestions. I must, however, specially thank Mr. C. C. Barnard. Librarian of the London School of Hygiene, for invaluable help in looking out references.

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RELATIONSHIP OF ALIMENTARY LIPAEMIA TO BLOOD COAGULABILITY

BY

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It has been clearly shown that a factor of lipoid nature is essential for the normal process of blood coagulation, although its precise character has not been finally determined (Macfarlane *et al.*, 1941). This finding led us to undertake experiments designed to discover whether the coagulability of blood is altered during the lipaemia which follows the ingestion of fat. The work is conveniently divided into two parts: (1) the influence of alimentary lipaemia on prothrombin times ("accelerated clotting times"); and (2) the effect of such lipaemia on the coagulability of blood estimated in silicone-coated tubes.

1. Influence on Accelerated Clotting Time

The technique adopted was the usual one-stage method of determining the prothrombin time (Fullerton, 1940). For a reason which is referred to later, Russell-viper venom ("stypven") was used as the thromboplastin in the test. The observations may be divided into three groups.

(*a*) In a group of eight patients taking the ordinary ward diet, blood was removed at intervals after meals and the accelerated clotting times were determined. The fat content of these meals varied from 12 to 30 g. The accelerated clotting times showed no significant variation throughout the day.

(*b*) A group of five patients were given a breakfast containing 65 g. of fat (bacon, eggs, bread, and butter). The results are shown in Table I. It is seen that in each case a significantly shorter time was found at the height of the lipaemia, with an average reduction of 4.9 seconds.

TABLE I.—*Accelerated Clotting Times after Fat Intake of 65 g.*

Case	Fasting* (Seconds)	Time† (Hours)	Shortest Reading‡ (Seconds)	Difference§ (Seconds)
1	22·5	3	15·4	7·1
2	23·7	3½	19·7	4·0
3	23·0	2½	19·8	3·2
4	25·1	3	20·2	4·9
5	25·8	3	20·6	5·2
Means	24·0		19·1	4·9

TABLE II.—*Accelerated Clotting Times After Fat Intake of 85 g.*

Case	Fasting* (Seconds)	Time† (Hours)	Shortest Reading‡ (Seconds)	Difference§ (Seconds)
1	24·5	5	10·9	13·6
2	22·3	4½	13·4	8·9
3	23·0	3	12·8	10·2
4	24·3	2½	17·5	6·8
5	22·3	3½	14·8	7·5
6	24·7	3½	13·1	11·6
Means	23·5		13·7	9·8

* Accelerated clotting times with the patients fasting.
† Time interval at which the shortest accelerated clotting time was reached during the lipaemia.
‡ Actual reading obtained.
§ Differences between the fasting and the shortest times.

(*c*) In a group of six patients similar observations were made following a meal containing 85 g. of fat (two eggs, 2½ oz. (70 g.) of bacon, 1 to 1½ oz. (28 to 42 g.) of butter, bread, tea with milk and sugar). The results are shown in Table II. Again in each case a marked reduction in the accelerated clotting time is evident during the lipaemia, and its degree is much greater than with a fat intake of 65 g. The effect is probably due to an increase in the essential lipoid factor during lipaemia. The other forms of thromboplastin ordinarily used in the accelerated clotting test—for example, acetone-dried extracts of rabbit brain (Quick, 1938) and viper venom plus ovolecithin (Witts and Hobson, 1940)—do not reveal this reduction during alimentary lipaemia. Presumably this is because these thromboplastins contain large amounts of lipoid, so that alterations in the plasma content of lipoid are obscured (Fullerton and Anastasopoulos, 1949).

It was realized that the findings set out in Tables I and II could not be interpreted as indicating that a real increase in coagulability occurs during lipaemia. The inference that naturally occurring thromboplastin is influenced by lipaemia in a manner similar to viper venom is not justified. Accordingly, similar experiments were performed using the clotting time in silicone-treated tubes as a measure of the coagulability of blood.

2. Influence on Clotting Time Measured in Silicon-coated Tubes

Method

"Teddol," a silicone-like material, was used. It reacts vigorously with water, yielding hydrochloric acid with heat evolution and a solid silicone formed by the intercondensation of the resulting hydrolysis product. Tubes measuring 3 by ⅜ in. (7.5 by 1 cm.) were filled with "teddol," and after ten minutes the solution was poured off and the tubes were inverted and allowed to drain for two minutes. They were then washed thoroughly in five changes of distilled water and were dried at room temperature. In estimating the clotting time with these tubes a needle, without a syringe, was inserted into a vein at the elbow and the first few millilitres of blood was run into a tube containing oxalate solution. This sample was later centrifuged, and the degree of lipaemia was estimated macroscopically. The first sample presumably contained any thromboplastin resulting from the trauma of the venepuncture. Then approximately 2 ml. was run into each of two teddol-coated tubes, and immediately these tubes were placed in a water-bath at 37° C.

Each tube was examined by tilting every five minutes, and the end-point taken was the time at which the tube could be inverted without flow of the blood. The object of using two tubes was to assess possible variations due to different degrees of silicone coating. Occasionally, if clotting appeared to be almost but not quite complete at any reading, another examination was made before the next interval of five minutes had elapsed. It may be pointed out here that the difference in the readings given by the two tubes did not exceed five minutes in any case.

Results

(*a*) With this technique the changes in the clotting time of whole blood were observed during the phase of lipaemia following the ingestion of a meal rich in fat (80–85 g.) composed of bacon, eggs, bread, and butter. Table III shows the preliminary results in four normal subjects. It is seen that in each case the clotting time three hours after the meal was considerably shorter than the fasting time. Macroscopic lipaemia was present at three hours in each case.

TABLE III

Case	Fasting	3 Hours	Difference
	mins.	mins.	mins.
1	25, 25	15, 15	10
2	30, 30	15, 20	13
3	30, 30	10, 15	18
4	25, 25	15, 20	8

(*b*) The experiment was then expanded to include readings at 3, 3½, and 4 hours after the meal in 11 subjects. The results are presented in Table IV. It is seen that in Cases 1–9 much shorter clotting times occurred following the high-fat meal. The maximal reduction varies from five to fifteen minutes and averages ten minutes. In Cases 1–9 macroscopic lipaemia was present following the meal. In Cases 10 and 11 a significant reduction in clotting time did not occur; in neither of these cases was macroscopic lipaemia observed at 3, 3½, and 4 hours after the meal.

TABLE IV

Case	Fasting	3 Hours	3½ Hours	4 Hours	Difference
	mins.	mins.	mins.	mins.	mins.
1	25, 27	20, 20	20, 23	15, 20	9
2	25, 25	15, 15	15, 15	10, 10	15
3	20, 20	10, 15	10, 10	14, 10	10
4	20, 25	20, 20	20, 15	15, 20	5
5	20, 20	10, 13	10, 10	10, 15	10
6	20, 20	15, 18	15, 12	15, 12	7
7	20, 25	10, 10	15, 15	—	12
8	25, 20	15, 20	20, 20	5, 10	15
9	15, 20	15, 10	10, 15	15, 20	5
10	20, 20	20, 25	20, 20	25, 20	0
11	15, 15	15, 15	12, 10	10, 14	4

TABLE V

Case	Fasting	3 Hours	3½ Hours	4 Hours	Difference
	mins.	mins.	mins.	mins.	mins.
1	15, 15	15, 20	15, 15	15, 15	0
2	15, 15	15, 20	15, 15	15, 15	0
3	20, 20	23, 25	20, 20	25, 25	0
4	30, 33	25, 27	25, 27	25, 25	6
5	20, 20	20, 18	20, 20	20, 22	1
6	25, 25	22, 25	25, 20	25, 25	3
7	25, 25	25, 25	25, 25	25, 25	0
8	30, 27	25, 25	25, 25	25, 25	3
9	20, 20	10, 15	10, 10	10, 15	10

(*c*) As a control, observations were made in nine patients before and after the ordinary ward breakfast (fat content 12–30 g.). The results (Table V) show that, with the possible exception of Case 4, a significant reduction occurred in only one case (No. 9). In Cases 1–8 no macroscopic lipaemia was observed at 3, 3½, and 4 hours after the meal; in Case 9 macroscopic lipaemia was present at these times and was absent in the fasting sample.

Comment.—The results in Tables III, IV, and V show that the coagulability of blood as measured by this technique increases markedly after a high-fat intake if this produces macroscopic lipaemia. Conversely, meals low in fat have no influence on the clotting time unless macroscopic lipaemia develops. These results would seem to have greater significance than those given in section 1, since they demonstrate that clotting induced by naturally occurring thromboplastin is accelerated by lipaemia. Whether this effect is due to an increase of the essential lipoid factor or to an alteration in the physical state of the plasma dependent upon its high content of chylomicrons during lipaemia has not been determined, and in any event the distinction does not influence the significance of the findings. We have discovered only one reference to observations similar to those described above. Duncan and Waldron (1949), using collodion-lined tubes, demonstrated a shortening of the clotting time in dogs and in humans, after the ingestion of cream. The implications of the results were not discussed.

Discussion

Lipaemia and Thrombosis

The results of these experiments seem striking enough to justify speculation regarding the pathogenesis of thrombosis, both arterial and venous.

Lipaemia is common in diabetes mellitus (Bloor, 1921; Joslin, 1927), pregnancy (Boyd, 1934), leukaemia (Pernokis

and Freeland, 1941), and after ether anaesthesia (Boyd, 1936) and acute blood loss (Boyd, 1934; Horiuchi, 1920). In all these circumstances thrombosis is frequent, although, of course, additional factors must be borne in mind; for example, the arterial degeneration in diabetes, venous stasis produced by the gravid uterus in pregnancy, the increased viscosity of blood in leukaemia, and immobilization after anaesthesia and blood loss. Nevertheless it seems possible, in view of the results described above, that the increased coagulability produced by lipaemia may be a factor responsible for the frequency of thrombosis in the conditions mentioned. It is known that coronary thrombosis not infrequently follows ingestion of a large meal (Master *et al.*, 1940; Smith *et al.*, 1942; Boas, 1942). It is impossible, however, on the evidence available, to determine whether this association is due to the decrease in coronary blood flow accompanying gastric distension (Gilbert *et al.*, 1940) or to the increased coagulability of blood which we have shown follows the ingestion of meals rich in fat.

Perhaps stronger evidence in favour of our thesis is given by the numerous observations which relate thrombosis to the dietary intake of fat. For example, Dock (1946) has noted that diets rich in eggs, cream, and butter are particularly common in men who are neither diabetic nor hypertensive, but who develop myocardial infarction. Malmros (1949) also considers that excessive consumption of eggs, butter, and other foods rich in fat may be the cause of the large numbers of cases of myocardial infarction now being observed. He points out that in Denmark the consumption of fat has been high for a long time and did not decrease in the second world war, whereas in Norway the consumption of fat and eggs was very low during the war. He thinks that this may explain why there was a fall in the incidence of myocardial infarction in Norway but not in Denmark during that period. Closs and Dedichen (1949) showed a similar fluctuation in the incidence of thrombo-embolic disease in general during the war in Norway.

Lipaemia and Atherosclerosis

Although the pathogenesis of atherosclerosis remains obscure despite intensive investigations for many years, some recent work has tended to discount the view of Virchow that the essential lesion is a primary degeneration in the arterial wall and has lent support to the earlier work of Rokitansky. This point of view has been emphasized in recent years by Duguid (1949, 1952), who holds that the lesion in atherosclerosis does not arise initially within the arterial wall but follows the incorporation into the vessel wall of fibrin deposits which are covered by vascular endothelium and later show hyaline and fatty change. If this conception be correct then it follows that any factor which leads to intravascular fibrin formation may be of importance in the pathogenesis of atherosclerosis. The results of our experimental work have led us to consider whether alimentary lipaemia may be a factor of importance in this process.

A large volume of work indicates that the level of the serum cholesterol probably bears some significant relationship to the development of atherosclerosis (Boas *et al.*, 1948; Gubner and Ungerleider, 1949; Duff and McMillan, 1951; Gould, 1951; Keys, 1951a, 1951b; and Katz, 1952). Numerous investigations on these lines have been carried out since Anitschkow (1933) showed that arterial lesions similar to atheroma followed cholesterol feeding in rabbits. As Keys *et al.* (1952) have pointed out, this finding cannot be applied directly to the problem of atherosclerosis in humans, since the amount of cholesterol needed to produce the lesions in rabbits is fantastically high in comparison with the cholesterol content of the diet in man. He concludes that "from the animal experiments alone the most reasonable conclusion would be that the cholesterol content of human diets is unimportant in human atherosclerosis." In any event, it is now clear that in man there is no relationship between the serum cholesterol level and the habitual dietary intake of cholesterol (Keys, 1949; Keys *et al.*, 1950; and Gertler *et al.*, 1950) but marked changes in the cholesterol level occur when the intake of fat is altered (Keys *et al.*, 1950; Hildreth *et al.*, 1951; and Keys, 1952). It is thus apparent that the large amount of evidence which links high serum cholesterol levels with the development of atherosclerosis may simply mean that a high-fat intake is related to atherosclerosis, and it is our suggestion that the high-fat intake acts by inducing increased coagulability of blood during phases of lipaemia.

Any theory of the pathogenesis of thrombosis and atherosclerosis must account for the notable variation in the age of onset and also for the tendency for the lesions to increase with age. Therefore it would be necessary, if our theory is to withstand criticism, to adduce evidence that the degree of lipaemia following ingestion of fat shows considerable individual variation and that in general it tends to be greater in the elderly than in the young. It is not difficult to find experimental work which supports both these suggestions (Necheles *et al.*, 1949; Morrison *et al.*, 1949; and Moreton, 1950). In our own studies we have noted great variation from case to case in the macroscopic degree of lipaemia following the standard high-fat breakfast, and Morrison and his co-workers (1949) devised a fat-tolerance test which showed that the rise in the serum lipid constituents following a high-fat meal varied within wide limits and was particularly high in 25 patients with recent coronary thrombosis. Necheles *et al.* (1949), by a study of the chylomicron counts after the ingestion of fat, found that this measure of lipaemia was altered much more in elderly individuals than in the young.

We suggest, therefore, that the pathogenesis of atherosclerosis may not be so obscure as it has appeared in the past. The conception that lipaemia, by leading to increased coagulability, produces fibrin deposits which are incorporated into the arterial wall accords well with our experimental findings and with a large amount of circumstantial evidence relating atherosclerosis to fat intake and serum cholesterol levels. It does not of course explain the apparent increase of atherosclerosis in the coronary arterial tree, but it is important not to let this particular aspect overshadow the general problem. We know of no convincing evidence that the overall incidence of atherosclerosis is increasing to a greater extent than can be accounted for by the general increase in longevity; the cause of its frequent and early localization in the coronary arteries may well be a problem separate from that of atherosclerosis in general.

It should be pointed out that our findings suggest that it is the occasional high intake of fat that is likely to be important rather than the average daily intake, since we found that the normal ward breakfast was followed by an increase in coagulability in only one case. If further work supports the theory set out above, studies of fat tolerance will become of increasing importance. In this way it might be possible to use the information thus obtained to determine which individuals are likely to develop atherosclerosis if a high dietary intake of fat is continued.

Summary

Alimentary lipaemia increases the coagulability of blood as measured by the "accelerated clotting time" and the clotting time in silicone-coated tubes.

The possible relationship of this finding to the pathogenesis of thrombosis and atherosclerosis is discussed.

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ASSOCIATION BETWEEN PERIOD OF GESTATION AND LENGTH OF MENSTRUAL CYCLE

BY

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It has often been stated that the period of gestation may be a multiple of the length of the menstrual cycle. This possibility is suggested by evidence, in experimental animals and in man, of cyclic activity in the ovary during pregnancy, and by a supposed association between the length of the cycle and the duration of pregnancy. The association can by no means be said to be established in man, the lack of good data being due largely to the difficulty of establishing the length of the menstrual cycle. In the course of an inquiry in which pregnant women were investigated from the first antenatal attendance until two years after the birth of the child, we have recorded both the period of amenorrhoea and the length of the cycle for 1,227 mothers of single births, and the data are here used in an examination of the association between the two variables.

Period of Amenorrhoea Related to Length of Cycle

We have attempted to collect fairly extensive data in respect of pregnancies of all mothers domiciled in the County Borough of Smethwick whose children were born between April 1, 1949, and March 31, 1950. We are here concerned only with the period of gestation and the length of the menstrual cycle.

(*a*) *Period of Gestation.*—Our only indication of the period of gestation is the duration of amenorrhoea. The date of onset of the last menstrual period was recorded at the first antenatal attendance,* and the date of birth was extracted from the records of notification of birth submitted to the public health department.

(*b*) *Length of Menstrual Cycle.*—Either on leaving hospital or at the first home visit of a health visitor, mothers were given a calendar on which they were asked to cross off each day of bleeding during the year after the birth of the child. This calendar was printed on a child's record card, on which were entered other items of more interest to the mother (such as the weight of the child). Mothers were subsequently interviewed at a welfare centre or at home within two weeks of each quarter during the year following birth, at which time the record card was inspected and the menstrual history copied on to another document. These documents provided the data used in the analysis which follows.

As a means of excluding some pregnancies of abnormal length, the examination is restricted to the 1,227 mothers of single births whose children survived to the end of the first year. (For example, this device excludes several pregnancies whose duration is influenced by the presence of a malformed foetus.) For 362 of the 1,227 mothers the data were considered incomplete, either because the period of amenorrhoea was not reliable or because fewer than three menstrual cycles were recorded in the year after birth.

Of the 865 cases in which the data were thought to be complete enough, 149 were excluded because the menstrual history was irregular. It is not possible to give any precise indication of what constituted an irregular history, except to say that two observers inspected the data independently, and with few exceptions decided upon exclusion of the same cases.

Table I shows the association between the length of the cycle and the period of amenorrhoea for the 716 women who had at least three regular cycles, and for whom the period of amenorrhoea was recorded unequivocally. The shortest mean length of cycle was 23 days (six women) and the longest 45 days (one woman).

The data suggest that the period of amenorrhoea increases slightly with the length of the cycle. The association is, however, somewhat irregular. This irregularity is attributable largely to the fact that the mean length of cycle for each woman has been calculated from all cycles during the year. Inspection of the records indicates that many women whose menstrual cycles are in general quite regular have one or two cycles which are grossly inconsistent with the others, and whose inclusion must make the mean less accurate. We have therefore recalculated the mean length of cycle for each of the 716 women, after excluding cycles whose lengths were judged to be inconsistent with the other observations. Table II gives the number of recorded cycles upon which the adjusted means are based: thus for 37 women the mean is based on three cycles, and for 34 on four.

TABLE I.—*Period of Amenorrhoea Related to Length of Cycle. Length of Cycle is Given as a Crude Mean*

Mean Length of Cycle (Days):	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Over 38	Total
Mean period of amenorrhoea (days)	271·5	271·0	280·0	277·5	278·9	278·1	280·8	281·7	285·4	280·7	279·3	285·2	286·0	283·0	281·8	290·1	—	280·9
No. of women	6	6	24	51	76	113	126	111	65	51	34	18	12	6	8	7	2	716

*70% of the mothers were supervised during the antenatal period by one of us (T. D.).

TABLE II.—*Number of Cycles upon which Adjusted Mean Length of Cycle is Based*

No. of Cycles	No. of Women	No. of Cycles	No. of Women
3	37	8	105
4	34	9	137
5	56	10	129
6	70	11	60
7	88		716

In Table III the adjusted means are used to relate the period of amenorrhoea to the length of the cycle. The chart shows a straight line* fitted to the observations, and the means have also been plotted. The data indicate that the period of amenorrhoea increases by about a day for each additional day on the length of the cycle.

Before accepting these results we should consider the possible objection that a menstrual history recorded in the year after the birth of a child may not be typical. It is difficult to know what could be regarded as a typical menstrual history of parous women. We have, however, excluded grossly abnormal cycles, as indicated above, and we have satisfied ourselves that the results are not substantially affected by variation associated with birth order or maternal age.

Discussion

The possibility that the period of gestation may be a multiple of the length of the menstrual or oestrous cycle, and that the time of onset of labour coincides with an estimated time of reappearance of the cycle, is suggested by three kinds of evidence.

TABLE III.—*Period of Amenorrhoea Related to Length of Cycle. Length of Cycle is Given as an Adjusted† Mean*

Period of Amenorrhoea (Days)	Mean Length of Cycle (Days)																Total
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	
238–244	—	—	—	1	—	3	1	1	—	—	—	—	—	—	—	—	6
245–251	—	—	1	2	1	1	1	2	—	2	—	—	—	—	—	—	10
252–258	1	—	2	3	3	4	1	1	2	—	1	—	—	—	—	—	18
259–265	—	1	3	3	6	6	5	1	1	2	1	—	—	—	—	—	29
266–272	1	2	2	11	9	18	13	10	4	4	2	1	1	—	—	—	78
273–279	2	2	7	9	15	26	32	24	8	7	3	5	3	—	—	—	143
280–286	1	2	7	15	29	43	38	21	20	9	—	4	2	—	1	—	192
287–293	1	—	4	13	15	21	27	27	24	13	7	5	5	1	1	2	166
294–300	—	—	1	4	8	7	7	11	5	4	2	5	2	—	—	2	58
301–307	—	—	—	1	—	2	2	2	3	1	—	—	—	—	—	—	11
308–314	—	—	—	—	—	1	—	—	4	—	—	—	—	—	—	—	5
Total ..	6	7	27	62	86	132	127	100	71	42	16	20	13	1	2	4	716
Mean‡ ..	274·8	274·0	276·0	278·0	279·9	279·1	280·7	282·2	286·1	281·8	281·7	285·8	285·1	—	—	—	280·9
Error of mean	4·49	2·72	2·32	1·68	1·21	1·04	0·88	1·13	1·33	1·87	3·09	1·94	2·33	—	—	—	0·43

† See text for method of adjustment. ‡ Means have been calculated from the ungrouped data.

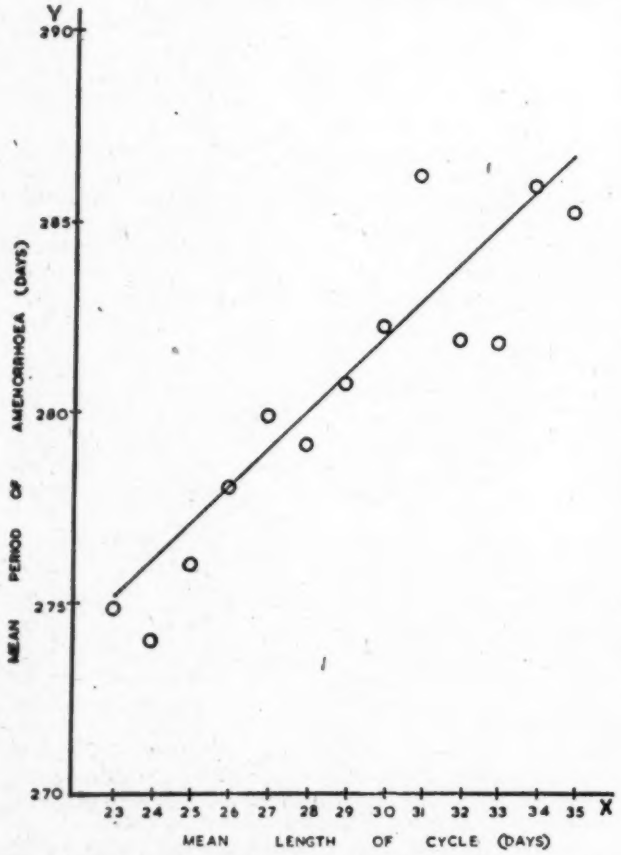

Chart showing mean period of amenorrhoea related to mean length of cycle.

*The regression of mean period of amenorrhoea on mean length of cycle was estimated by the method of least squares from the data given in Table III. The equation of the fitted line is $y=253.39+0.95x$.

1. It is well established that all cyclic activity of the ovary does not cease during pregnancy. As a rule this activity consists in ripening of fresh follicles without ovulation, a phenomenon observed in several species by Loeb (1923) and Evans and Swezy (1931). But occasionally overt manifestations of cyclic activity have been noted; for example, by Nelson (1929) in the rat, and by Tinklepaugh (1933) and Elder and Yerkes (1936) in the chimpanzee. Hartman (1932) referred to two reports (by Saint Hilaire and Cuvier, and by Allesch and Fox) of menstrual bleeding throughout pregnancy in women, and Wintz (1925) described two interesting cases of periodic bleeding from the empty horn of a bicornuate uterus.

2. The fact that in a few species the mean duration of gestation is approximately a multiple of the mean length of cycle has been considered significant (Shaw, 1926; Snyder, 1938). In animals such as the rat and mouse the association is scarcely surprising, since the duration of pregnancy (20–21 days) would be a multiple of any cycle of less than six days. But in man the observation that the mean period of amenorrhoea (280 days) is ten times the mean length of the menstrual cycle (28 days) is more suggestive.

3. In man, the length of the cycle and the duration of gestation are said to be correlated. Jolly (1928) recorded histories of five women with regular 24-day cycles whose pregnancies were 265 days, when estimated from the middle day of the last menstruation to birth, and corresponded roughly to 11 cycles. Results on women with longer cycles were inconsistent. More extensive data published by Wahl (1936, 1937) undoubtedly suggest that the duration of gestation increases with the length of the cycle, although the increments are too small to be consistent with the view that the one is a multiple of the other.

In the present communication it is shown that among women with regular cycles the mean duration of amenorrhoea (from onset of menstruation to birth) increases by about a day for each additional day in the mean length of the menstrual cycle. This also suggests that the period of gestation is not a multiple of the length of the cycle. A more plausible explanation of the association between the two variables is as follows.

There is good reason to believe that the length of the post-ovulatory phase is fairly constant, being about 14 days, and that variation in the length of the cycle is due mainly to variation in the pre-ovulatory phase (Zuckerman, 1937; Latz and Reiner, 1942; Corner, Hartman, and Bartelmez, 1945; Rock and Hertig, 1948; and Krohn, 1949). The period of amenorrhoea might therefore be expected to increase by one day for each additional day in the length of the cycle, even if the time between ovulation and birth were constant. In Table IV the period between ovulation and birth has been estimated by subtracting the interval between

TABLE IV.—*Period Between Ovulation and Birth Related to Length of Cycle*

Mean Length of Cycle (Days)	Period of Amenorrhoea (Days)	Assumed Interval between Onset of Menstruation and Ovulation (Days)	Estimated Period between Ovulation and Birth (Days)
23	274·8	9	265·8
24	274·0	10	264·0
25	276·0	11	265·0
26	278·0	12	266·0
27	279·9	13	266·9
28	279·1	14	265·1
29	280·7	15	265·7
30	282·2	16	266·2
31	286·1	17	269·1
32	281·8	18	263 8
33	281·7	19	262·7
34	285·8	20	265·8
35	285·1	21	264·1

the onset of menstruation and ovulation (assumed to be 14 days for women with 28-day cycles, and adjusted according to length of cycle) from the periods of amenorrhoea recorded in Table III. The estimated periods between ovulation and birth obtained in this way are all reasonably close to the mean of 266 days, based on 716 births.

It is concluded that variation in the period of amenorrhoea according to the length of the menstrual cycle is probably determined by variation in the interval between the onset of menstruation and ovulation. If this is so, the period between ovulation and birth seems to be independent of the length of the cycle.

It is perhaps necessary to stress that the observation that the period of amenorrhoea increases by about a day for each additional day in the length of the cycle is based on mean values derived from a large number of cases. The mean duration of gestation is of course associated with many other variables, and it seems unlikely that its association with the mean length of cycle can be used in individual cases to give an estimate of the expected date of delivery more accurate than the conventional one.

Summary

The association between the period of gestation and the length of the menstrual cycle has been investigated in 1,227 women whose menstrual history was recorded for one year after the birth of a child. The data were considered adequate for 716 women with regular cycles.

It is shown that the period of amenorrhoea (from the onset of menstruation to birth) increases by about a day for each additional day in the length of the cycle.

It is suggested that variation in the period of amenorrhoea according to the length of the menstrual cycle is determined by variation in the interval between the onset of menstruation and ovulation. If this is so, the period between ovulation and birth seems to be independent of the length of the cycle.

We are indebted to Dr. Hugh Paul and to the midwives and health visitors of the Public Health Department, Smethwick, for their assistance in this inquiry. The nursing staff of St. Chad's Hospital assisted in the completion of the antenatal and birth records.

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THE ACUTE HYPOXIC EPISODE*

BY

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"Anoxia not only stops the machine, but wrecks the machinery."—HALDANE.

A good deal has been written on the subject of hypoxia, and great stress has been laid upon its deleterious effects on certain systems and organs, and on the organism as a whole. All authors stress the importance of avoiding hypoxia and of promptly terminating it should it occur.

Courville (1939) has examined the pathological findings associated with acute hypoxia in nitrous oxide anaesthesia. Although it is more than 10 years old his classification of the pathological findings, based on the severity of the hypoxic episode and the length of survival time, retains as much of its value to-day as it did when it was first published.

Many conditions, both medical and surgical, may be accompanied by hypoxia, but the surgeon encounters it in its most dramatic form—that is, as acute cardiac failure, arrest, or standstill. It is generally recognized that in these cases the immediate concern is to re-establish efficient pulmonary ventilation by artificial respiration combined with oxygen, and to restore the circulation to the vital centres by manual systole. Efficient manual systole must be accomplished within four minutes from the time that heart action has ceased, and more quickly if possible. If chronic hypoxia has preceded the acute episode, then the period within which circulation to the vital centres must be restored may be very much shorter than four minutes. There are many cases on record in which recovery has followed cardiac arrest lasting longer than four minutes, but as the minutes pass the chances of full, and later of partial,

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recovery become progressively less. Once the circulation has been restored, the various manœuvres designed to induce spontaneous resumption of cardiac activity may be carried out in a deliberate and somewhat more leisurely way; or else they may not be needed at all, as not infrequently the heart will resume beating under the stimulus of manual systole alone.

Although literature on hypoxia is extensive, there are only scattered and inadequate references to the treatment of the post-hypoxic state. It is generally assumed that irreversible damage to the vital structures, and particularly to the brain and brain stem, occurs at the instant of the hypoxic episode and that treatment is futile on account of the irreversibility of the damage. We believe, and we hope to show in the following discussion, that the passive "wait-and-see" attitude which has hitherto prevailed is not justified, and that active treatment is not only possible but is vitally necessary if we are to save a number of those who in the past would have succumbed. We agree that any destruction of nervous elements at the time of the hypoxic incident is irreversible, but suggest that in many cases such total destruction is only of minor extent and that there are large areas of reversibly damaged tissue which is capable of recovery under suitable management. We believe that much of the fatal hypoxia and extensive cerebral damage occurs in the post-hypoxic period, and can thus be prevented.

The Role of Cerebral Oedema

One of the sequelae of acute hypoxia is the appearance of cerebral oedema. This is only to be expected, as oedema will appear anywhere in the body where oxygen want has interfered with the integrity of the capillary membrane. This oedema interposes a physical barrier between the oxygen-supplying blood capillaries and the cells. In the brain the oedema, affecting as it does a structure enclosed in a rigid bony case, has the further damaging effect of raising intracranial pressure and of thus interfering mechanically with cerebral circulation. Thus the initial hypoxia becomes potentiated, and with it the hypoxic damage mounts, completing a vicious circle of great detriment to the chances of the subject's recovery. It is of little avail at this stage that the original hypoxic episode has been controlled. The vicious cycle will continue even after, say, the heart has been restarted after cardiac arrest and efficient circulation has been re-established. It is necessary to break the vicious cycle—that is, to treat the existing or developing cerebral oedema. We believe that even the pre-terminal hyperpyrexia which is often seen in these cases may in at least some of them be explained on the basis of oedema involving the heat-regulating area. Therefore this sign need not be taken as necessarily pre-terminal, although it often precedes death. We take it to mean only that extensive damage is present which is extending into the hypothalamus.

Dehydration Therapy

With these considerations in mind, we have of late subjected patients who have had an acute hypoxic episode to a regimen of vigorous dehydration. The following case history is presented as an example of the method of treatment, and also because of the extreme severity of the hypoxia, which yet was followed by a quite unexpected return to apparent clinical normality.

A well-nourished man of 43 was to undergo thoracotomy for carcinoma of the left lung. His general condition before operation was good, and apart from his present illness there was no other major disorder. Bronchial obstruction due to the growth made it impossible to collapse the affected lung during operation, and after some manipulations cyanosis began to appear, and continued to increase in intensity. The cyanosis was not relieved by repeated tracheo-bronchial toilet, and only momentary improvement followed whenever a moderate amount of blood and secretions was aspirated from the dependent lung. The lesion was found to be inoperable and the chest was closed; this was completed two hours and thirty-five minutes after induction. After closure the patient reacted, opened his eyes, but still his colour remained dusky as before. Bronchoscopy was done and much material was aspirated; while this procedure was still in progress cardiac arrest occurred.

The chest was immediately reopened and an asystolic flabby heart was found. Manual systole restored circulation to the extent that a carotid pulse could be felt; soon the heart resumed spontaneous action. An estimated four minutes had elapsed from the time the diagnosis of cardiac arrest had been made to the establishment of manual systole. Oxygen administration through an endotracheal tube had been carried out from the instant the heart had been known to have stopped. After efficient heart action had been observed for some 10 minutes, the chest was closed. The patient was breathing spontaneously and oxygen administration was continued, but he remained in deep coma with widely dilated pupils and all reflexes absent. The colour was improved but by no means satisfactory.

At this stage, half an hour after successful restoration of circulation, 50 ml. of 50% glucose was injected intravenously, and within one minute signs of lightening of the coma were observed, such as roving eyeballs and involuntary incoordinated movements of the extremities. This improvement persisted for a little over half an hour, when coma again deepened without, however, reaching the depth that had obtained prior to the glucose medication. Some four hours later the temperature began to rise rapidly, and the injection of glucose was repeated. This time the patient made attempts at sitting up and even of getting out of bed, but he was still unconscious. Later the coma again deepened, but the level did not reach to where it had been before the second injection. The temperature began to fall and during the night a slow intravenous drip of 1,000 ml. of 25% glucose was given. He remained in light coma during the following day, but regained consciousness on the third post-operative day, and thereafter made an uneventful although slow recovery. He had no residual neurological symptoms and presented no evidence of kidney damage from the hypertonic solution when he was discharged from hospital 10 days later.

This was a case in which total hypoxia of at least four minutes, superimposed as it was upon prolonged severe hypoxia, made it likely that the patient would succumb; yet after vigorous dehydration therapy he recovered with no apparent residual damage. This would indicate that the nervous elements destroyed beyond recovery by the original hypoxia must have been relatively few. It was striking how after each administration of hypertonic glucose the coma markedly lightened and never quite returned to its previous depth, and how by the same measure it was possible to check hyperpyrexia. That the result was not permanent after each administration is not surprising, as we know that oedema recurs after the drug has ceased its dehydrating action. This has been sometimes called "rebound oedema." The improvement observed was not due to the glucose itself, as it has been shown that glucose is ineffective in increasing cortical survival time, at least in rabbits exposed to hypoxia (Noell and Chinn, 1950); nor does it increase resistance to hypoxia in dogs (Snapp, Adler, and Kramer, 1948). The same has incidentally been shown also in rabbits for glutamate, pyruvate, succinate, and fumarate (Noell and Chinn, 1950).

It would appear that concentrated human serum albumin, which has been recommended as a substitute for hypertonic glucose in the control of oedema (Cole, 1951), is also useful in these cases, and it has been employed by one of us in a recent case. Another substance which is worth trying, especially because of its universal availability, is double or quadruple concentrated plasma. This may be obtained by reconstituting dried plasma with half or one-quarter the quantity of water usually employed. On theoretical grounds plasma expanders, such as dextran and polyvinylpyrrolidone would also seem to be indicated, but there is as yet not enough information to allow of their evaluation as dehydration agents. Serum or plasma has proved as effective as hypertonic glucose and may actually be preferable, as the latter, if administered for any length of time, may lead to renal damage. However, this should not be a deterrent to its use in the absence of a more suitable agent, for the con-

dition of the patient is desperate. It may be advantageous to give a diuretic agent at the same time as the hypertonic solutions, in order to maintain kidney function during this critical period. Efficient kidney function is probably a very important factor in the control of the oedema. Recurrence of oedema will be prevented largely by a rigid control of fluid and electrolyte administration, but the effectiveness of such control depends much upon adequate renal function.

Adequate Oxygenation

Oxygen is administered continuously throughout the post-hypoxic period, and a mask or nasopharyngeal catheter is preferred to a tent on account of its greater efficiency. A scrupulously clear air-way is maintained at all times and secretions are often aspirated through an endotracheal tube. A slight head-down tilt of the bed at approximately 7 degrees assists the drainage of secretions without interfering unduly with cardio-respiratory function or causing congestion of the head. There should be no hesitation to perform a tracheotomy in order to ensure an unobstructed air-way or to facilitate the removal of secretions. Tracheotomy is also advisable if coma is prolonged, as it is unwise to keep an endotracheal tube in position for longer than 24 to 36 hours.

While a clear air-way is of the first importance, the adequacy of tidal exchange must not be overlooked. These patients may remain in a state of chronic hypoxia if adequate ventilation is not ensured. If necessary they can be placed in a Drinker respirator or a similar device. We recently observed a case in which post-operative hypoxia occurred when the patient was returned to her bed. Ten hours later she was still unconscious with only leg reflexes remaining; under a regimen of endotracheal tube, Drinker respirator, and concentrated albumin, she revived sufficiently in three hours to respond to instructions. Analeptic drugs have no place in the treatment of the post-hypoxic respiratory depression, having been shown in rabbits to be actually harmful (Noell, 1948).

Other Measures

Another problem in these cases which requires mention is that of gastric dilatation. This condition is combated by early passage of a stomach tube; the tube may be left *in situ* to ensure against recurrence of dilatation, and may later be used for feeding purposes if coma is prolonged.

Meanwhile general supportive measures are carried out vigorously. Nutrition of the patient must be ensured, and may be carried out via a stomach tube, as described; intravenous protein hydrolysates are administered if necessary. Vitamins of the B complex and vitamin C are of advantage. Blood is transfused, and in this one must be guided by the actual amount lost. Overtransfusion is very harmful in these cases, but so is any deficiency of the oxygen-carrying elements of the blood. The blood pressure must be maintained, and for this vasopressors are preferred to intravenous fluids over and above the minimum requirements, so as not to interfere with the dehydration regimen. For the same reason electrolytes, particularly sodium, are omitted from such solutions as must be given. It must always be borne in mind, however, that along with the brain the whole body is being dehydrated; this necessitates a careful watch on the patient's electrolyte balance during the period of this therapy. If the blood pressure proves difficult to maintain, vasopressors are administered. Schmidt (1950) has shown that intracranial vessels are relatively insensitive to all drugs that constrict blood vessels elsewhere, and hence any of the innumerable vasopressors available may be employed. We personally prefer *nor*adrenaline in a continuous drip for a period of time, or, failing this, phenylephrine hydrochloride (" neosynephrine ").

Antibiotics are administered, and the stir-up regimen is followed—this consisting in turning the patient frequently from one side to the other; and carbon dioxide inhalations for short periods may also be indicated. This not only improves pulmonary ventilation but also has a potent cerebrovascular dilating effect. The important point to remember is that under no circumstances must these patients be left flat on their back for any length of time. As the coma lightens, they may become very restless. If this occurs the temptation to over-sedate must be resisted, else the central depression and consequently reduced tidal volume will precipitate further hypoxia.

In an attempt to increase cerebral circulation, stellate ganglion block has been recommended and is widely employed, but it is still controversial whether the smaller cerebral vessels possess muscular constricting elements, and no final agreement has been reached on their extrinsic innervation (Schmidt, 1950). However, we are not too much concerned with these small blood vessels, but rather with the larger stems and the named vessels. It may be argued that these too should already be in a state of maximum dilatation; but that they are capable of further dilatation when the stellate ganglion is blocked can be inferred by use of the flicker photometer, and that they actually do dilate under conditions of hypoxia after a stellate block can be observed directly on retinoscopy. In the absence of localizing signs, the ganglion to be blocked is the one opposite to the side of the patient's usual preponderance. If, however, no result is obtained we would not hesitate to carry out a bilateral block despite dangers which have been ascribed to this procedure. We have seen no ill effects from it. Various drugs have also been recommended and tried in order to improve cerebral circulation, but they appear to be of little value.

Conclusion

Our therapeutic resources against the effects of acute hypoxia are few. They must ensure adequate oxygenation of the vital tissues of the body and suppress cerebral oedema with its potentiating effect on the hypoxic damage to the central nervous system. We believe that a dehydration regimen combined with the administration of oxygen, maintenance of an adequate tidal exchange, and general supportive measures afford the best means of achieving these ends. However, even when this line of treatment is adopted, it is still quite impossible to prognosticate on the outcome in individual cases. We have seen patients who immediately after the acute hypoxic episode looked fairly well deteriorate rapidly within a matter of hours, probably owing to rapidly developing and poorly controlled cerebral oedema, while others even after many days of coma regain consciousness without showing residual damage. Hence, we must not abandon hope in even those cases which seem hopeless at the onset; once an acute hypoxic episode has taken place, the patient's chances of recovery depend largely on our acting quickly, thoroughly, and completely.

Summary

A line of treatment is presented to combat the sequelae of acute hypoxia. This is based on the assumption that much of the damage is due to cerebral oedema which supervenes after the acute hypoxia has been relieved. Vigorous dehydration, combined with the administration of oxygen, maintenance of adequate tidal exchange, and general supportive measures are the mainstay of treatment.

We wish to acknowledge with thanks the helpful and constructive suggestions received from Dr. Paul Bucy, professor of neurology and neurological surgery at the University of Illinois.

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PYRIMETHAMINE ("DARAPRIM") IN THE TREATMENT OF VIVAX MALARIA

BY

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At a meeting of the Royal Society of Tropical Medicine and Hygiene in July, 1952, it was suggested that pyrimethamine might prove of value in effecting a radical cure of vivax malaria by destroying the late exoerythrocytic forms of the parasite which are presumed to be responsible for relapse. The investigations here recorded were undertaken with the object of testing this theory.

The parasite used was the Madagascar strain of *Plasmodium vivax* which has been maintained at Horton for the routine treatment of neurosyphilis for the past 28 years. A peculiar characteristic of this strain of *P. vivax* is its tendency to give rise to attacks of fever with parasitaemia between the 30th and 40th weeks after mosquito infection. In most cases these attacks represent relapses following a primary attack which has begun 9 to 15 days after infection. In some instances the incidence of the primary attack itself may be delayed until this period.

The subjects of the trial were 12 patients, none of whom had a previous history of malaria. Each of them was subjected to the bites of 10 to 12 mosquitoes from an infected batch of *Anopheles atroparvus* on September 6, 1952. An overt malarial attack developed in each case after an incubation period of 9 to 11 days.

Each patient underwent a course of 50 mg. of pyrimethamine given as a single daily dose over a period of five days (total 250 mg.). Treatment was begun in all cases on the day when parasites were first found in the peripheral blood. In two cases this was on the day before the first rise of temperature, but in the remainder it was on the first or second day of fever.

Result

In three of the subjects relapses (pyrexia with parasitaemia) occurred 55, 74, and 88 days after the last day of treatment (see Chart). Each relapse was treated, as in the primary attack, with a five-day course of 50 mg. of pyrimethamine daily. The patient who relapsed on the 74th day experienced a second relapse on the 14th day after completing his second five-day course. He was treated for this with a single dose of 50 mg. of pyrimethamine, but relapsed again 22 days later. A fourth subject relapsed on the 99th day. It was thus already clear that treatment of the primary attack with pyrimethamine in full dosage was not an effective method of preventing relapse of this strain of *P. vivax*.

It was now decided to test the effect of a weekly dose of 25 mg. of pyrimethamine given over a period of two months on the incidence of late relapses, which, as noted above, may be expected to occur with this strain of *P. vivax* between the 30th and 40th week after infection. Accordingly, on the 99th day after completion of the first course (the day on which the fourth patient (D) relapsed), the whole group, with the exception of the individual (A) who had already relapsed twice, received a single dose of 25 mg. of pyrimethamine, which was repeated at weekly intervals for the next seven weeks (eight doses in all).

Fifty-nine days after the last weekly dose (32 weeks after the infecting feed) the patient (B) who had relapsed on the 55th day experienced a second relapse. Every other member of the group, without exception, relapsed on one or more occasions between the 32nd and 41st weeks after the infecting feed (see Chart). There was thus no indication that the eight-weeks course of pyrimethamine given from the 17th to the 24th weeks after infection had had any effect on the subsequent relapse rate.

The results afford a striking example of the very high rate of relapse which occurs with this strain of *P. vivax* following *early* treatment of the primary attack. In patients who are allowed to have a dozen or more peaks of fever with this strain of parasite before the primary attack is terminated (as in the routine treatment of neurosyphilis with malaria therapy) the relapse rate is in the region of 50% only.

Effect of Pyrimethamine on Clinical Attack.—As was to be expected from the experience of other observers, the clinical response to pyrimethamine in the primary attack was slow. Fever persisted for seven days in one case, for six days in three, for five days in five, for four days in two, and for three days in the remaining one. It is clear that pyrimethamine unaided is not a satisfactory drug for the treatment of vivax malaria in a non-immune subject.

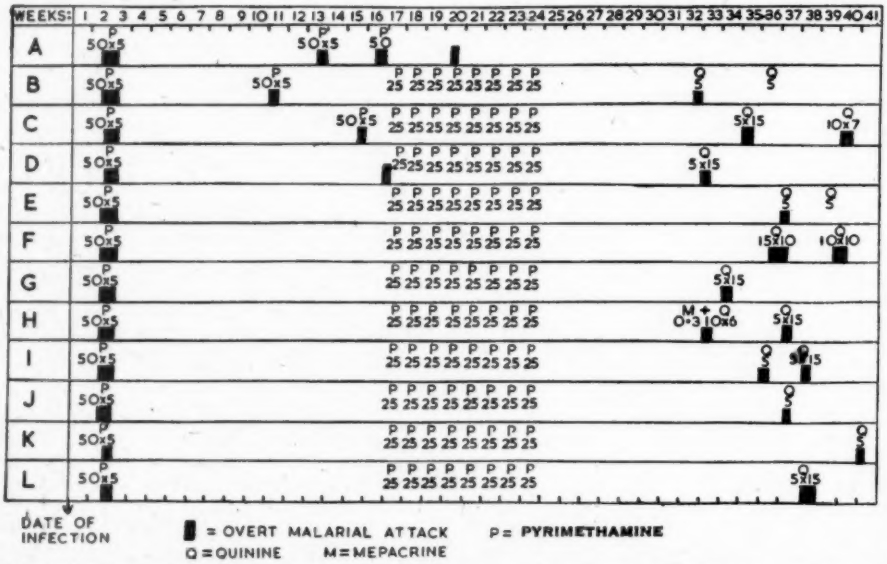

Chart showing results of pyrimethamine treatment of 12 patients suffering from primary attacks of mosquito-induced malaria.

Toxicity

One of the patients (F) developed pyrexia on the eighth day after completing the five-day course of 50 mg. of pyrimethamine given for treatment of the primary attack. Fever continued in an irregular fashion for eight days, but no parasites were found at any time in the peripheral blood despite repeated and intensive search of both thick and thin smears. Two days after the onset of fever there was epistaxis over a period of 12 hours. On the following day the red blood cell count was 4,000,000 per c.mm.

and the white-cell count 2,000 (polymorphs 22%, lymphocytes 70%). The patient was given one litre of blood intravenously and was treated with penicillin, crude liver extract, and pentnucleotide. Under this regime his condition progressively improved, and 15 days after the first rise of temperature the white-cell count had returned to normal. A sternal puncture specimen taken on the eighth day of his illness showed maturation arrest of the granulocytes.

It was at first thought that in the case of this individual the dosage of pyrimethamine administered (250 mg. in five days) had exceeded the limit of tolerance. He had been in the hospital for over 12 months and had received no previous treatment likely to give rise to such a syndrome. However, in the 36th week after the infective feed he experienced a malarial relapse attended with profuse epistaxis and leucopenia. The clinical picture, though considerably less severe, resembled that observed in the previous attack. Malaria parasites were seen in the peripheral blood, though in very scanty numbers. The only antimalarial drug given on this occasion was quinine (5 gr. (0.32 g.) thrice daily for 10 days).

The patient had had no pyrimethamine since his primary attack except the eight-weeks course of 25 mg. weekly which was completed three months before his relapse. It seems probable that his symptoms were attributable rather to an abnormal susceptibility to this strain of malaria parasite rather than to any effect of the drug. None of the other patients in this series (three of whom underwent a second five-day course of 50 mg. of pyrimethamine daily during their first relapse) showed any ill-effect from taking the drug, nor was there any abnormal feature in their blood count.

Summary

Twelve patients suffering from primary attacks of mosquito-induced vivax malaria (Madagascar strain) were treated with 50 mg. of pyrimethamine daily for five days. The clinical response to the action of the drug was slow, and for this reason alone we regard it as unsuitable for treatment of the clinical attack in non-immune subjects.

Four of the patients relapsed between the 55th and 99th days after completing the course, one of them on two occasions.

On the 99th day 11 of the group were given a single dose of 25 mg. of pyrimethamine, which was repeated at weekly intervals for the following seven weeks. All of them relapsed on one or more occasions between the 8th and 18th weeks after completing this eight-weeks course.

There is no indication that either of the two courses of pyrimethamine administered in this trial (50 mg. daily for five days during the primary attack and 25 mg. weekly for eight weeks, starting three and a half months later) were of any value in preventing the incidence of relapse, though it is possible that the attacks might have occurred somewhat earlier had the drug not been given.

We wish to express our thanks to Dr. J. H. Watkin, physician-superintendent, and to the staff of Horton Hospital for their co-operation in carrying out this investigation.

The British Standards Institution has issued a sectional list of British standards for hospital equipment. It catalogues standards for medical and surgical apparatus; laboratory glassware and scientific apparatus; furniture and fittings; textiles and clothing; photography and radiography; methods of testing; symbols, tables, and definitions; and electrical equipment. The list also includes a note on what new standards for hospital equipment are now being prepared. The list (P.D. 1644, dated June, 1953) is obtainable from the British Standards Institution (Sales Branch), 24, Victoria Street, London, S.W.1.

LEPROSY: REPORT ON FOUR CASES

BY

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AND

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Although a temporary increase in the incidence of leprosy in Great Britain was expected following the second world war (Ryrie, 1947), the disease remains relatively uncommon. Compulsory notification was introduced in September, 1951. In England and Wales 48 cases were notified in 1951 and 65 in 1952, but at least 100 of these were existing known cases. In Scotland seven cases had been reported up to the end of 1952.

During the past four years the four cases reported below were encountered in routine hospital practice in one city. It will be seen, however, that not all were due to the aftermath of global war, at least two being attributable to factors peculiar to a jute-manufacturing seaport. Even in this small series the diverse symptomatology and varying clinical types of the disease are well illustrated.

Case 1

The Goanese wife, aged 23, of a British Service man was first seen in May, 1948, with a circinate lesion of the right lower leg of 18 months' duration (Fig. 1). The margin of the lesion was raised and infiltrated, while the central flat area showed marked loss of sensation to light touch and pin-prick. No other skin lesion was present, nor could any thickened nerves be found. Biopsy of the active edge showed a tuberculoid histology; no acid-fast bacilli were demonstrated either here or in a nasal scrape. The lepromin test was positive.

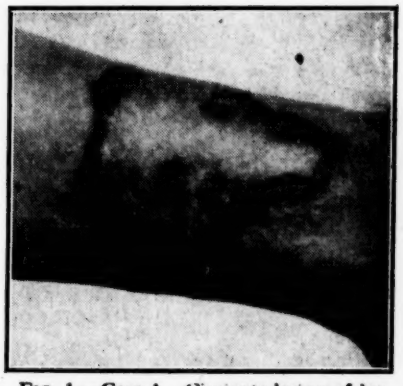

FIG. 1.—Case 1. Circinate lesion of leg before treatment with solapsone.

Treatment with weekly intradermal injections of "moogrol" for two months produced no improvement. In December, 1948, solapsone by mouth was started. The maximum tolerated dose of three 0.5-g. tablets was taken intermittently over a long period. When last seen in May, 1951, the leg lesion had almost disappeared and sensation in the area showed considerable improvement.

Case 2

A British man aged 30, who had served in Cyprus, Syria, and India during the second world war, attended in August, 1948, with a generalized non-itchy eruption of brownish-red slightly infiltrated patches over the whole body surface. The Wassermann reaction was negative. A tentative diagnosis of sarcoidosis was not confirmed by biopsy, which showed an infiltrate of mononuclear cells and lymphocytes surrounding sweat ducts and follicles. In view of the possibility of a pre-mycotic eruption *x* rays and thorium X were applied to selected areas, without clinical benefit.

More lesions appeared, and in April, 1950, the face had become "leonine" (Fig. 2). The following neurological signs were then elicited: impairment of all forms of sensation over the larger plaques on the trunk, with palpable thickening of ulnar and lateral popliteal nerves on both sides. A thick palpable nerve was present on the medial side of the right knee-joint. Biopsy of a nodule under the chin revealed numerous acid-fast bacilli in "globi" and scattered throughout the dermis. Bacilli were also found in a nasal scrape. The lepromin test was negative.

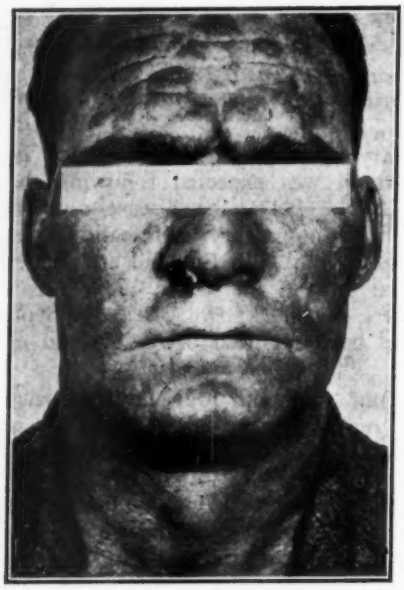

FIG. 2.—Case 2. Before treatment with thiosemicarbazone.

Treatment with thiosemicarbazone, 150 mg. daily, was started in May. Frequent blood examinations and liver-function tests revealed no deviation from normal and the patient had noted no side-effects. The skin lesions flattened gradually, and the leonine facies disappeared within one year. A nasal scrape was negative in March, 1952, and biopsy at that timed revealed scanty and degenerated acid-fast bacilli in the skin. Treatment was continued with a dose of 100 mg. of thiosemicarbazone daily.

Case 3

A British man aged 65, who had retired after 30 years' service in India, was first seen in February, 1950, complaining of numbness and wasting of the right hand for four years, followed a year later by numbness of the left forefinger and of both feet.

Examination revealed scattered areas of depigmentation of the skin on the arms and legs. Weakness of both grips, the right more than the left, was present. There was wasting of the small muscles of the right hand, particularly the three ulnar interossei and the hypothenar muscles, and slight wasting of the left hypothenar muscles. Trophic sores and healed blisters were present on both hands, particularly on the right. The deep reflexes were normal in the arms; the right knee-jerk was diminished, the left normal; both ankle-jerks were absent. The plantar responses were flexor; the abdominal reflexes were present. Scattered areas of sensory loss to light touch, pin-prick, and temperature were present on the arms and legs. Position, vibration, and pain senses were normal. Some thickening of the ulnar nerves behind the medial condyles of the humeri was noted.

Biopsy of the edge of a depigmented area on the leg showed histological changes compatible with a diagnosis of leprosy, but no acid-fast bacilli could be demonstrated. The diagnosis of leprosy was confirmed by Dr. Ryrie. On his recommendation diaminodiphenyl sulphone (D.D.S.) was started in February with an initial dose of 100 mg. daily, later increased to 300 mg. daily. Only slight improvement was noted during treatment with this drug. The grips became stronger but the sensory loss was not appreciably lessened. After six weeks' treatment the drug had to be stopped for 10 days on account of malaise accompanied by slight cyanosis and an increase in urinary urobilinogen. In March, 1951, after 12 months' treatment, the condition had become static. Thiosemicarbazone was then substituted after a rest period of two weeks. The initial dose of 100 mg. daily was quickly increased to 150 mg. daily and this latter dose was maintained for 12 months without toxic effects. The disease seemed to be arrested, though no dramatic change in the condition had occurred.

Case 4

An Indian aged 30, temporarily resident in the city, was first seen in January, 1953, complaining of numbness and tingling of both feet. There was a history of treatment for leprosy in India until August, 1952.

Examination revealed no skin lesion, but a thickened nerve was palpable on the dorsum of the right foot and a similar thickened nerve was found below the right knee. The ulnar nerves also appeared thicker than normal. Areas of partial anaesthesia were found above both wrists; while in the feet hyperaesthesia of the proximal two-thirds was associated with diminished sensation over the distal thirds. A nasal scrape revealed numerous acid-fast bacilli, mainly packed in macrophage cells. Treatment with oral solapsone was started.

Comment

All four patients had contracted the disease in areas where leprosy is endemic. Cases 1 and 2 are connected with the movement of Service men during the war, but Cases 3 and 4 stem from the interchange of personnel between a jute-manufacturing Scottish town and the jute-producing areas of India and Pakistan.

Case 1 illustrates the tuberculoid type of the disease, while Cases 2 and 4 are undoubtedly lepromatous. Case 3 apparently belongs to the uncharacteristic type which cannot be placed in either polar group (Muir, 1948).

Little inference can be drawn from the results of treatment. It is doubtful if the intermittent and inadequate treatment with solapsone by mouth had any influence on the tuberculoid case. In the uncharacteristic case, in which irreversible tissue changes have occurred, therapy could not be expected to show any positive response but the symptoms and signs have certainly not progressed. The response of Case 2 to thiosemicarbazone has been good, and the gratifying absence of toxic side-effects supports Ryrie's (1950) views on the use of this drug. Nevertheless, many years must elapse before the question of "cure" by this or any other chemotherapeutic method can be assessed (Cochrane, 1952).

Summary

Four cases of leprosy occurring in hospital practice in one British city during the past four years are reported. The relatively high incidence is explained by local factors in addition to the expected post-war increase. Results of treatment to date are recorded.

We are indebted to Dr. John Kinnear and to Professor I. G. W. Hill for permission to publish these cases. We gratefully acknowledge the expert assistance of the late Dr. G. A. Ryrie and of Dr. R. G. Cochrane, of the British Empire Leprosy Relief Association.

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The Foot Health Educational Bureau has been incorporated in the Central Council for Health Education. The Bureau was founded in 1941 to stimulate public interest in the care of the feet, to effect liaison between the leather and shoe trade on the one hand and the medical profession on the other, to advocate good standards of shoe manufacture and fittings, and to influence the public towards the purchase of the right shoe for the job. It has run conferences and "Foot Health Weeks," and published many booklets and pamphlets. Its advisory services are used by local authorities, hospitals, schools, and the trade.

CASE OF LEPROSY SEEN IN A VENEREAL DISEASE CLINIC IN BRITAIN

BY

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Cases of leprosy are infrequently seen in venereal disease clinics in Great Britain. In view of this the following case is interesting enough to merit publication.

Case Report

A married British metal-worker aged 36 attended the medical out-patients department on May 12, 1951, with a history that he had been perfectly well until a month previously, when swelling of the ankles, arms, and hands developed. This was accompanied by a nodular rash on the face, back of the hands, forearms, and dorsal aspects of the feet. He was feeling perfectly well. He was admitted for investigation, and a tentative diagnosis of sarcoidosis was made.

A biopsy report on one of the nodules on the dorsal aspect of the left forearm was very suggestive of sarcoid, but a second biopsy was asked for. Unfortunately at this time he had discharged himself from hospital as he felt so very well. An *x*-ray film of the chest and finger-joints did not confirm the diagnosis.

In September, 1951, he developed a profuse nasal discharge which was occasionally blood-stained, especially first thing in the morning. This was treated by his own doctor with little success. In April, 1952, he was referred to the oto-rhino-laryngologist, Mr. Petty, who suggested that a Wassermann test be taken; this was found to be positive. The patient was then referred to the Infirmary.

On examination on May 2 a discrete symptomless nodular eruption was present on the face, back of the hands, extensor surface of the forearms, and dorsal aspects of the feet. The nodules measured about ¼ by ¼ in. (0.3 by 0.3 cm.). A non-irritating squamous erythematous rash was present over the anterior surface of both tibiae. The lesions had remained unchanged during the past twelve months.

The information was elicited that from 1938 to 1943 the patient had served abroad whilst in the armed Forces and had returned to England in the latter year. He had not been out of England since. Whilst abroad he served in India, Iraq, Palestine, Abyssinia, South Africa, and the Libyan Desert, and some of the regiments in which he served had coloured personnel. There was no history of venereal infection or any convincing clinical evidence of venereal disease. Nothing abnormal physically was elicited in the cardiovascular or central nervous system. Blood Wassermann and Kahn tests at this time were negative. Cerebrospinal fluid examination was within normal limits. His wife's Wassermann and Kahn reactions were negative.

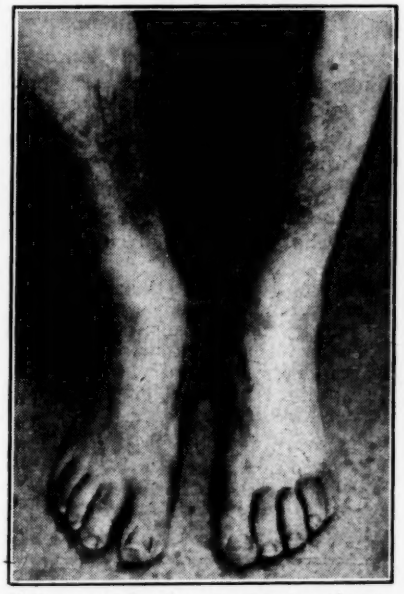
A specimen of the patient's blood was forwarded to the Venereal Disease Reference Laboratory, St. Peter's Hospital, Whitechapel, on May 9. The routine Wassermann test was positive, serum diluted 1 in 128; cardiolipin Wassermann reaction positive; routine Kahn test positive; and Price's precipitation reaction negative. Dr. Orpwood Price reported: "In the absence of any history of syphilis, I should like to test another specimen from this patient before expressing an opinion."

On May 23 a routine Wassermann test was positive, serum diluted 1 in 32; a routine Kahn test negative, and Price's precipitation reaction negative. Dr. Orpwood Price reported: "The general pattern of this patient's serology and the history appears to favour the opinion that the positive reactions are non-syphilitic in nature. I therefore suggest that he be tested at monthly intervals in order to find out the general pattern of his serological reactions." At this stage a tropical non-venereal disease was regarded as a likely cause of the serological reactions.

Further specimens of blood were tested on June 27 and July 17; the reactions of the former were anti-complementary, and the latter sample was reported on as follows: "Routine Wassermann reaction positive, serum diluted 1 in 64; cardiolipin Wassermann reaction positive; routine Kahn reaction negative; Price's precipitation reaction negative."

On July 4 a biopsy of one of the nodules on the right cheek showed a histological picture closely resembling sarcoid. On July 31 a biopsy of one of the nodules on the forehead showed a similar histological picture to the previous sections. Cutaneous leishmaniasis and sporotrichosis were ruled out.

Sections were then forwarded to Professor R. A. Willis, of Leeds University. He expressed the opinion that the sections showed nothing histologically very distinctive, suggesting leprosy as a remote possibility. Ziehl-Neelsen - stained sections revealed a profusion of intrahistiocytic acid-alcohol-fast bacilli. A nasal swab and ear clippings showed moderate numbers of *Mycobacterium leprae*.



Photograph showing squamous erythematous rash on anterior surface of tibia.

When Dr. Orpwood Price was told that the patient was proved to be suffering from leprosy he suggested that he should perform Nelson's treponemal immobilization test on the patient's serum as a matter of interest; this test gave a clear-cut negative result.

Discussion

When a patient with a positive Wassermann reaction gives no history of venereal disease and no convincing clinical evidence of venereal disease, specimens of blood should be examined at monthly intervals to determine the general pattern of the serology. If it is then concluded that the positive reactions are non-syphilitic in nature and are probably in the nature of biological false-positive reactions, steps must be taken to determine the cause of those reactions. Confirmed (to exclude technical error) positive standard serological reactions occurring in the absence of treponemal infection are biological false-positive reactions. Stokes and James (1949) consider that the biological false-positive may be part of a general-infection reaction mechanism shared by many diseases and forms of injury and more highly developed in some persons than in others.

Moore and Mohr (1952) state that the chronic biological false-positive reaction is not innocuous and not to be discussed lightly, but is often, perhaps usually, a manifestation of serious underlying disease. The chief conditions in which such a reaction may occur are leprosy, the allergic diseases such as disseminated lupus erythematosus, periarteritis nodosa, rheumatoid arthritis, rheumatic fever, and sarcoid. Stokes, Beerman, and Ingraham (1944) state that a biological false-positive Wassermann reaction is found in 60–80% of cases of leprosy.

It is of interest that in the present case Nelson's treponemal immobilization test was negative, as this test is claimed to differentiate between true and biological false-positive Wassermann reactions. Nelson *et al.* (1950) state that the treponemal immobilizing antibody does not occur in the serum of normal persons or of those suffering from non-treponemal diseases. They have shown that of 57 lepers seropositive by standard tests (76% of those tested), 47 were negative with the treponemal immobilizing test. The incidence of positive reactions with the latter test was approximately the expected incidence of syphilis in the social and socio-economic groups from which the lepers were drawn.

It is feasible that our patient contracted leprosy as a result of prolonged contact with coloured troops.

Summary

A case of lepromatous leprosy exhibiting a chronic biologically false-positive Wassermann reaction is presented. The importance of considering the possibility of a biological false-positive Wassermann reaction in the absence of convincing clinical evidence of syphilis is stressed. Steps must be taken to determine the cause of the false-positive reaction. Histologically the lesions somewhat resembled sarcoid.

I am indebted to Dr. Douglas J. Campbell for help and advice in the preparation of this paper; to Dr. I. N. Orpwood Price for his interpretation of the serological reactions; to Professor R. A. Willis for his histological report; to Dr. H. Lederer, pathologist, Doncaster Royal Infirmary, for criticism and advice; and to the Department of Medical Photography, Sheffield Royal Hospital, for the photograph.

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Medical Memorandum

Two Cases of Polyarteritis Nodosa with Uraemia

Polyarteritis nodosa is now being diagnosed during life with increasing frequency (Klein, 1949). The following cases manifested general symptoms, particularly kidney involvement with uraemia. The first patient died in a uraemic state, whilst the second apparently recovered.

CASE 1

A house-painter aged 62, the father of three healthy children, was admitted to the surgical department on March 29, with complaints of severe pain and superficial ulcerations in the lower extremities of two months' duration. The family history was irrelevant. He had suffered from bronchial asthma for the past 17 years, and had been using ephedrine to relieve his attacks. Physical examination revealed limited chest excursions with musical rales in both lungs; the heart sounds were muffled, but no murmurs were heard. The blood pressure was 120/70 mm. Hg, and the pulse rate 74. The lower extremities were warm, with small petechiae and small areas of superficial necrosis over the toes and the medial and lateral areas of both legs. The right dorsalis pedis artery was not palpable. The E.S.R. and full blood count were normal, the blood urea was 42 mg. per 100 ml., W.R. and Kahn were negative; a chest radiograph showed increased lung and hilar markings, and the aorta enlarged and elongated.

A tentative diagnosis of thromboangiitis obliterans was made, and periarterial sympathectomy was performed on both femoral arteries (Leriche). At operation the arteries were found to be constricted. The patient made an uneventful recovery, the ulceration of both legs improving and after leaving hospital healing completely and never reappearing. He continued to have occasional asthmatic attacks. The pain in the legs recurred three months after operation, but was less severe, and appeared on exposure to cold; he continued thus for about a year and a half, until readmission. Four weeks before this he began to suffer from very severe frontal and occipital headache, accompanied by dizziness, but without vomiting. The headache was severer at night than during the day; analgesics gave relief for a few hours only. He noticed that his legs had become swollen, and two weeks later his face also became swollen, especially around the eyes. On several occasions his urine was red. There was no lumbar pain and no frequency or dysuria. His urine contained albumin, many red cells, and a few white cells and casts. The blood urea was 56 mg. per 100 ml. He looked pale, with slight oedema of the face, especially around the orbits, and of the legs. Physical examination was normal throughout, but there was tenderness on fist percussion over the loins. His blood pressure was 200/120. *Fundi:* Disk boundaries blurred, blood vessels enlarged, arterial reflexes increased, many haemorrhages and cotton-wool exudates.

A few days after admission the patient developed a severe generalized epileptiform seizure, with loss of consciousness and white foam at the mouth. His blood pressure was 250/150. He was given aminophylline intravenously, and the attack subsided. On the sixth day after admission his temperature rose to 102° F. (38.9° C.). He complained of slight pain in the pharynx, but examination revealed no apparent reason for the fever. The white cells numbered 10,800, a few days later increasing to 19,200 per c.mm. The differential count showed a shift to the left, the eosinophils remaining between 2 and 3%. The urine showed no change. Sulphadiazine and penicillin were given with no effect on the temperature. The headaches increased. The blood urea rose to 77–98 mg. per 100 ml. Plasma euglobulin was increased. Cold fraction strongly positive—irreversible at room temperature. On the fourteenth day after admission he developed a slight cough. On physical examination there was slight dullness at the base of the right lung, with many crepitations. An *x*-ray film of the lungs showed density of the right base. Eye-ground findings showed improvement. The haemorrhages and exudates were absorbed. On the twentieth day the patient complained of abdominal pain; the abdomen was soft and there was no localized tenderness. The white cell count was 20,000 per c.mm., and the urine showed no change.

The protean nature of the complaints—headache, fever, cough, abdominal pain, pain in the extremities, the fluctuating nature of the eye-ground changes, as well as the anaemia, leucocytosis, the increased E.S.R., the blood-protein changes, and the renal insufficiency—suggested polyarteritis nodosa.

During the following week the patient's condition deteriorated. The urinary findings became more pronounced, especially the haematuria. The blood urea increased in a few days from 98 to 262 mg. per 100 ml., and he died on the twenty-sixth day after admission, in a uraemic state.

Typical changes of polyarteritis nodosa in the kidneys, myocardium, liver, spleen, pancreas, and mediastinal fat tissue were seen at necropsy.

CASE 2

A married woman aged 25, with two healthy children, emigrated to Israel from Yemen in 1948. Three years before admission, when she arrived from Yemen at an immigrant transit camp in Aden, she had suffered for a few months from a febrile disease of unknown nature, and apparently recovered. Eighteen months later, a few weeks after arriving in Israel, she started to run a mild fever, fluctuating during the day, accompanied by severe headaches, pain in the neck, shoulders, and abdomen. She vomited three or four times daily. The attending physician suspected pregnancy, since menstruation stopped with the onset of the illness. This condition lasted for a fortnight, after which she felt better, and during the following month

she was able to work in the fields. Every now and then she felt feverish and weak, and suffered from headache and pain in the shoulders and upper abdomen. Albuminuria was found and she was sent to a hospital in town, where she stayed seven months, during which time she had recurrent periods of chilliness, severe headache, abdominal pain, dizziness, nausea, and vomiting. At that time no abnormal findings were detected on physical examination except for an enlarged and tender liver.

During her seven months' stay in the hospital the urine albumin fluctuated betwen 2 and 4.5%, and the blood urea between 18 and 180 mg. per 100 ml. The sedimentation rate fluctuated, but was always increased. Blood cultures were repeatedly negative, as well as blood examinations for typhoid and brucellosis. Sputum examination for tubercle bacilli was negative. Radiographs of the lungs, spinal column, gastro-intestinal tract, kidneys, and urinary tract did not show any abnormalities. Sternal puncture did not show a deviation from normal. The patient was given penicillin, streptomycin, and aureomycin with no effect on the course of the fever. The general condition continued to deteriorate, the anaemia became severe, and the differential count at one time showed 7% eosinophils. Finally, she was given three blood transfusions, which apparently had a good effect: her temperature became normal and she left the hospital slightly improved and without fever. Erythrocytes numbered 3,000.000 per c.mm.; urine showed albumin ++; blood urea, 40 mg. per 100 ml.

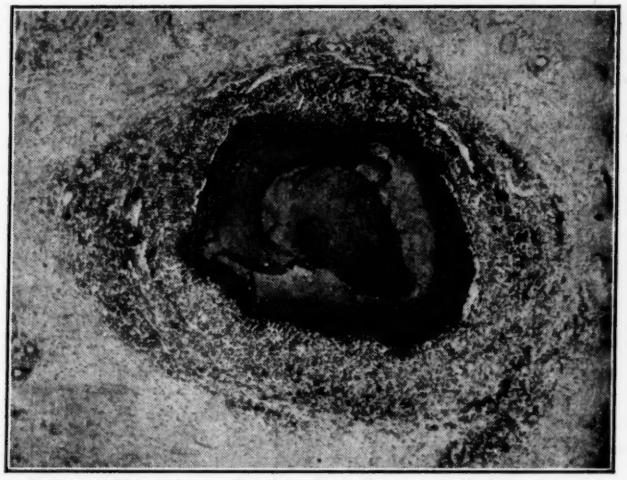
She returned home and felt well for two days, after which she had a new relapse of fever, severe headache, shoulder pain, chills, ringing in the ears, abdominal pain, and vomiting. In addition for the first time she had blurred vision, and also swelling of different parts of the body with itching which lasted for a few hours. A few days later she was readmitted. She was very weak and the state of nutrition was very poor; her skin was pale grey. Physical examination was normal throughout, with blood pressure 130/80, no oedema, and the urine containing albumin 4%; and many red and white cells but no casts. *Blood*: R.B.C. 3,500,000 per c.mm; Hb 10.5 g. %; W.B.C., 9,700 per c.mm., differential count normal except for 7% eosinophils; reticulocytes 0.9%; thrombocytes, 150,000; bleeding-time, 4 minutes; clotting-time, 3 minutes; sugar, 72 mg. per 100 ml.; urea 52 mg. per 100 ml.; cholesterol, 256 mg. per 100 ml.; Weltmann, 10; total proteins, 7.4 g.% (albumin 4 g., globulin 3.4 g.); euglobulin, increased; cold fraction positive, reversible. Wassermann, negative. *Kidney function*: standard urea clearance, 68%. *Sputum*: negative for tubercle bacilli. *Stools*: negative for ova (including schistosoma) and amoebae. *Rectoscopy*: Atrophied mucosa, no ulcers or granulation tissue seen. *Fundi*: Arterial constriction, increased reflexes of the arteries, haemorrhages in all layers of the retina, deep spotted and superficial flame-shaped, some of them being in a stage of reabsorption; multiple cotton-wool exudates. *X*-ray film of lungs and kidneys showed nothing abnormal. *X*-ray film of heart: slight left ventricular hypertrophy. E.C.G. normal.

The patient stayed for six weeks in the ward afebrile, while the urine albumin fluctuated between 1.5 and 4%, and the blood urea between 40 and 100 mg. per 100 ml. The eosinophils in the blood increased to 18%; blood cultures were negative several times. Repeated examinations of the fundi showed reabsorption of the haemorrhages and exudates.

A biopsy of the right pectoral muscle was made which, however, was negative for polyarteritis nodosa. Upon further inquiry the pathologist, who had received a biopsy specimen taken before the patient's admission to our hospital, informed us that the specimen showed the typical histological picture of acute periarteritis nodosa—fibrinoid degeneration of the intima and inflammatory changes in and around the arterial wall (see illustration). Decisive proof of the diagnosis was thus obtained.

The patient was in hospital for six weeks, her general condition gradually improving. She gained in weight; the albuminuria dropped to 0.5%. Blood urea dropped to 39 mg. per 100 ml.; the fundi showed great improvement; and she was discharged in an improved condition. Three and twelve months later she was found to be in good health. The blood count and blood pressure were normal, and the urine contained only traces of albumin. She gained in weight, looked well nourished, had no pain, and was able to perform her household duties and help her husband in the fields.

We were dealing with a disease running for over 10 months with febrile and afebrile periods, severe headache, abdominal and joint pains, normocytic anaemia, slight leukocytosis, and eosinophilia, hyperglobulinaemia with severe and constant involvement of the kidneys, marked rise of blood urea, massive albuminuria, haematuria, severe and



Polyarteritis nodosa. Section through artery of subcutaneous tissue.

rapidly changing eye-ground fundi findings with no hypertension. The fluctuating nature of the kidney manifestations, the febrile episodes, the abdominal pain, as well as the marked leucocytosis with eosinophilia, indicated the presence of a systemic disease leading to severe involvement of the kidney. The absence of skin eruptions and of pathological findings in the heart, and the presence of leucocytosis and eosinophilia, made the diagnosis of Libman-Sachs disease improbable. Subacute bacterial endocarditis was ruled out because of the absence of cardiac involvement, splenomegaly, clubbing of the fingers, and petechiae. The diagnosis of polyarteritis nodosa fitted the clinical picture best.

COMMENT

Prognosis of polyarteritis nodosa has had a better outlook during the past few years. Since the clinical manifestations of the disease are now better known, cases are diagnosed that previously would not have been recognized until necropsy. Our second case, the diagnosis of which was proved by biopsy, manifested clinically severe kidney involvement up to renal insufficiency. This patient made a remarkable recovery, and is now, at least 30 months after the onset of the disease, apparently in good health. The clinical course of this case indicates that prognosis, even when major organs, such as the kidney, are severely involved, need not be fatal.

Acknowledgment is due to Dr. H. Ungar, of the Institute of Pathology of the Hebrew University, Hadassah Medical School, Jerusalem, for the pathological data supplied.

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REFERENCE
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Reviews

CYTOCHEMISTRY

Cytochemistry: A Critical Approach. By Professor J. F. Danielli. Biological Research Series. (Pp. 139; illustrated. £1 12s.) New York: Wiley and Sons, Inc. London: Chapman and Hall. 1953.

Cytochemistry is a very recent offshoot from the main tree of biological research. As the author of this monograph points out, it has little in common with the essentially morphological approaches of cytology and histology, since the aim of the cytochemist is not to exhibit structure but rather to demonstrate the loci of specific chemical reactions normally taking place within the cell, and, furthermore, to measure their reactions in as quantitative a manner as possible. In this brilliant little book Professor Danielli begins with a general analysis of the possibilities of artifacts arising at various stages in the techniques used; he then proceeds to a description of recent work, a great deal of which is his own, on the localization of phosphatase activity, a form of activity which, to judge by the work cited, would appear to be at the basis of all secretory processes. The Feulgen reaction, which demonstrates the presence of deoxyribose nucleic acid, thereby permitting the staining of chromosomes during mitosis, relies on the conversion of the deoxyribose to an aldehyde; again, aldehyde would appear to be concerned in fat metabolism. Consequently the whole subject of the cytochemistry of aldehydes is of great practical importance, and the author devotes a chapter to this problem.

The relationship between synthesis of protein and nucleic acids is a theme running through most recent cytochemical studies. In the present monograph there is a valuable assessment of the recent work of Brachet and Caspersson among others. According to the author the claim that nucleic acids are concerned in protein synthesis is well grounded, and he puts forward the suggestion that the nucleic acids can influence or determine the folding of the newly synthesized protein chains, thereby imparting their specific characteristics. In a final chapter the future outlook in cytochemistry is briefly reviewed. The author points out that biochemistry, concerned as it is with homogenates, pulped tissues, and tissue extracts, is very indiscriminating in that all cells of an organ are usually treated as equal, whereas the cytochemist is well aware of the wide differences in chemical composition that often exist among cells of apparently the same histological type. He expresses the hope that the combination of the present indiscriminating approach of biochemists, and the more perceptive but undeveloped techniques of the cytologist, will be richly rewarding.

Written by a brilliant investigator, whose original contributions to the science of living matter have carried him into the very front rank of modern biologists, this monograph, by virtue of its critical yet imaginative approach, may justly be regarded as a masterpiece that will guide for years to come present and future investigators in this new branch of biology.

HUGH DAVSON.

INTRODUCTION TO RADIATION BIOLOGY

Radiations and Living Cells. By F. G. Spear, M.D., M.A., D.M.R.E. (Pp. 222; 60 figures. 18s.) London: Chapman and Hall. 1953.

This small volume is a most useful addition to the textbook literature on radiation biology as an introduction to the subject for medical and postgraduate students and for those workers such as physicists in allied branches of biological science. At the end of the book a bibliography suggests future reading of a mixed type to follow this initiation into the subject.

The author has throughout made clear the nature of the tissues and cells to which his descriptions of radiation effects apply, and this to the tyro is of tremendous value. He discusses the effects of radiation on cells generally and on the various tissues—adult, embryonic, or malignant—and refers to much experimental work and to theories of how radiation acts on cells. The book is well printed on good paper, in a form handy for the pocket. The illustrations are particularly clear and apposite.

Criticism of defects is always distasteful, but there seems to be an error in the labelling of Fig. 6, and it seems an error to refer to any cell divisions taking place in normal meiosis as "highly abnormal" (p. 24). The note about Sr^{89} retention (p. 149) leaves one ignorant of the method of administration. The importance of oxygen tension in connexion with cell sensitivity could profitably be discussed in view of its importance in clinical and experimental work, and it seems wrong to suggest that dose rate dependence is not compatible with the larger hypothesis of radiation (p. 195). The balance of language could be adjusted a little: "to equate the immaturity of normal cells with the anaplasia of malignancy" is on the same page as "what is called the atomic number."

These criticisms should not deter anyone from reading and keeping the book. It will be a great help to all starting an interest in radiobiology, while among radiotherapists and hospital physicists, who all know of Dr. Spear, it will enhance his already excellent reputation.

FRANK ELLIS.

CANCER IN CLINICAL PRACTICE

Basic Principles of Cancer Practice. By Anderson Nettleship, M.D., F.A.C.P. (Pp. 398. £2 14s.) London: Baillière, Tindall and Cox, Ltd. 1952.

In this book a professor of pathology tries "to tell something of what is known about cancers as clinical entities." The book is written primarily for the general practitioner and medical student. He gives a brief general description of the pathology, methods of diagnosis, and main lines of treatment of the various forms of cancer, and follows this with short accounts of cancer as it affects the various organs and regions of the body. There is also a chapter on cancer research and another chiefly on the medico-legal aspects of cancer. The facts are clearly stated and the author speaks with authority on pathological questions, but the clinical part is rather brief and scarcely sufficient for the medical student, who will need to supplement his clinical knowledge of the various cancers from textbooks on surgery.

We were interested to learn that "the improvement of cancer diagnosis by indoctrination of lay audiences has steadily lost its effectiveness," and felt some comfort in the words of a pathologist to the effect that "cancer research is too complex to be well understood even by its disciples." We hope the author is correct in his surmise that "there will probably never be the need for a large group of cancer specialists from whom the patient will first seek treatment," and can endorse his opinion that "it seems wise, therefore, that general practitioners become general oncologists, with a sound approach to the fundamental problems in each field" (the word oncology means the science or the study of tumours). This is an interesting book and there are over a hundred illustrations, but we wish the index were fuller.

ZACHARY COPE.

MENTAL DEFICIENCY

Notes on Mental Deficiency. By J. F. Lyons, L.R.C.P.&S.I., D.P.H., D.P.M., and W. A. Heaton-Ward, M.B., Ch.B., D.P.M. (Pp. 48. 3s. 6d.) Bristol: John Wright and Sons, Ltd. 1953.

The object of this booklet is to provide the newcomer with a practical guide to the administrative aspects of mental-deficiency practice and to give a sufficient treatment of clinical and aetiological factors, and of the objects and methods of care and training. In that it gives a simple outline of the subject and is written mainly from the hospital point of view, it will be helpful to nurses training in mental deficiency, and it may also be useful to social workers and duly authorized officers concerned with the community care of the mentally handicapped. The necessary pruning of inessentials has, on the whole, been well done, although some

of the space devoted to outworn aetiological theories might better have been devoted to the recent important work on intrauterine and genetic factors. Although it is not easy to explain hereditary influences to the layman in such small compass, an attempt to do so might well have replaced the description of the causes of "vitiation of the germ plasm." On the clinical side, too, the sections devoted to a few arbitrarily chosen rarities such as gargoylism and lenticular degeneration seems to be quite unnecessary and the system of headings in this section is rather confusing.

The need for a handbook of just this size and readability is great, and its appearance will therefore be welcome to lay workers in this field. But it must be said that the interpretation of the working of the Mental Deficiency Acts, and indeed the administrative sections generally, are much clearer and more up to date than the clinical sections.

ALEXANDER KENNEDY.

THORACOSCOPY

Operative Thorakoskopie. By Dr. Stanko Dujmušic. German translation by Dr. Rudolf Herz. (Pp. 222; 204 figures. M. 48.) Vienna-Düsseldorf: Wilhelm Maudrich. 1953.

This volume is a monograph on thoracoscopy and on its use in overcoming the difficulties which may arise in the production of a satisfactory pneumothorax for the treatment of pulmonary tuberculosis. The method was first developed by Jacobaeus, the distinguished Croatian surgeon, whose pupil and successor the author was. Although the subject is a limited field it is one in which experience and fine technique are essential to success, and these it is obvious that the author possesses in an exceptional degree.

The anatomy of the thoracic cavity as seen through the thoracoscope is fully described and illustrated by admirable coloured plates and diagrams, and there follows a discussion of the mode of formation of pleural adhesions and of their physical characters. The division of these adhesions is the chief problem of thoracoscopy, and the whole technique of this procedure is described in great detail, beautifully illustrated in colour. The various difficulties which may arise and their avoidance are discussed, as well as the possible risks. It would be difficult to imagine a more complete and precise treatise on a limited but important subject, and thoracic surgeons will find its perusal well worth while, even if their knowledge of German is limited. It is indeed a mine of accurate information admirably presented.

HENRY SOUTTAR.

LUNG ZONES

Pathologie et Structure Pulmonaires. By Professors H. Warembourg and P. Graux. (Pp. 221; 94 figures and 64 plates. 2,500 francs.) Paris: Masson et Cie. 1953.

The natural division of the lungs into lobes has served well for many purposes, but a new conception of lung structure has been taking shape, and the future specialist in lung diseases may have as much regional anatomy to learn as the neurologist. The modern view is that the lung is a segmented or zoned organ, each zone being self-contained and separated from its neighbours by connective tissue, with or without a fissure as well. This independence of the zones is not only anatomical but also clinical and pathological, and so we may have "zonitis" in many different sites. The final map of the zones has still to be drawn, and the nomenclature has yet to be standardized, but enough progress has been made to warrant the comprehensive survey here provided.

This could well be described as the book of the zone, for its scope is wider than that of the authors' *Pathologie des Zones Pulmonaires*, published in 1947. It opens with a historical introduction describing the evolution of the zone concept, from Ewart's adumbration of it in 1889 to the present day. The first part of the book gives the general anatomy of the bronchial tree, arterial tree, pulmonary veins, bronchial arteries, lymphatic system, and nerves of the lung. The second part deals with the anatomical, clinical, and radiological aspects of the individual zones in the three lobes of the lung, and ends with sections on the fissures and on the bronchi and bronchoscopy. The third part is devoted to pathology, and covers the main diseases of the lungs and bronchi, including malignancy, the final sections being on angiopneumography and zonectomy. The authors add a substantial and up-to-date bibliography of works in the chief European languages. The illustrations —many of them chest radiographs—are excellent.

The appeal of the book is unusually wide for a specialist work, since the subject is treated from the different viewpoints of the anatomist, radiologist, pathologist, physician, and surgeon. All these could read the whole work with pleasure as well as profit, for the authors' French is concise and easy.

RAYMOND WHITEHEAD.

CONTACT DERMATITIS

Contact Dermatitis. By George L. Waldbott, M.D., F.A.A.A., F.A.C.A., F.I.A.A., F.A.C.P. (Pp. 218; 131 figures. £3 3s.) Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

To play the detective has a great fascination for the physician, and the dermatologist is in a favoured position for this game. The characters and distribution of an eruption may enable him to show a knowledge of the patient's habits and pursuits or of his possessions which suggest the touch of magic. The industrial medical officer may be able to carry these observations to such a point as to know with certainty the exact phase in a particular process which has been responsible for a pattern of skin reaction in a workman. Some years ago under the title of *Occupational Marks* Dr. Ronchese[1] published a book on such industrial stigmata.

Dr. Waldbott, an allergist, has been impressed by the diagnostic significance of the patterns of reaction from external agents and has now written this monograph on the subject. He does not define his title. Some dermatologists include under it all forms of eczematous dermatitis produced by external agents, while others limit its use to those forms dependent on an allergic sensitization to an external contact, excluding primary irritants. It is in the latter sense that Dr. Waldbott uses the term "contact dermatitis." The work is well produced, on excellent paper, with 131 illustrations, most of which are clear and instructive. The author suggests that the work may be studied by the patient with contact dermatitis, to assist him in doing his own detection. This accounts, no doubt, for a semi-popular presentation and a rather unnecessary number of illustrations. It is a novel way of obtaining the patient's co-operation, but it seems to have been attended by some success. The work is interesting and amusing, as well as being instructive, and it will form a useful book of reference for the dermatologist and for the general practitioner who is sure of his diagnosis.

With the increasing complexity of the chemical character of our external contacts, there is a great increase in sensitization dermatitis from such sources. Dermatitis of this type may masquerade as constitutional eczema for years when recognition and removal of the cause would be immediately curative. Yet diagnosis is often fraught with difficulty, and it is dangerous and unwise to depart from fundamental principles and to accept the diagnosis of contact dermatitis without adequate proof. The neglect of history-taking and of necessary investigative procedures is not to be encouraged.

The author illustrates many interesting patterns of contact dermatitis on fingers and hands, some of which seem a little too good to be true and are certainly not as often encountered in practice as could be desired. It is difficult to go all the way with the allergist in his approach to the problem of pruritus ani and pruritus vulvae. The book as a whole is stimulating and concerns a field that is constantly expanding, but it is rather extravagant in size and in price.

J. T. INGRAM.

[1] *Occupational Marks and Other Physical Signs*, 1948. Grune and Stratton, New York.

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ANTIMALARIAL DRUGS

Because of strategic necessity research on antimalarial substances was vigorously pursued during the last war, and there has since been little slackening of the tempo. This is as it should be, for malaria is still probably the greatest killing disease in the world. The important work of Fairley and his colleagues put on a sound basis the therapy of malaria with the drugs in use during the war, but since 1946 experiments as comprehensive as his have not been possible. Thus pyrimethamine was at first thought to be very useful for the treatment of acute attacks of malaria, but this conclusion was reached after therapeutic trials in Africans who were partially immune. It is now known that in non-immune patients the drug acts slowly, and its unaided use in fulminating attacks may be dangerous and ought to be discontinued. Goodwin,[1] however, reported that it is an effective suppressant, and Coatney and his colleagues[2] showed that when individuals taking suppressive pyrimethamine are bitten by mosquitoes conveying *Plasmodium vivax* the onset of malarial symptoms may be indefinitely delayed. This implies that the drug has an effect on either the pre-erythrocytic or exo-erythrocytic forms of *P. vivax*, and the observation led to the hope that in overt malaria treatment with pyrimethamine would destroy exo-erythrocytic forms in the liver and late relapses would thereby be inhibited. On another page in this issue Sir Gordon Covell and his co-workers have now shown that these relapses are not inhibited, and it is thus clear that the exo-erythrocytic forms of the parasite survive the doses administered. But the possibility remains that the pre-erythrocytic forms may be susceptible to the drug. If this is so the drug still constitutes an important advance in malarial therapy, for when taken in suppressive doses the development of these overt attacks (and all later phases of the parasite) and late relapses would be inhibited.

In a letter at page 285 Lieutenant-Colonel Taylor draws attention to the fact that *P. falciparum* infections may occur among those taking pyrimethamine. His observations dovetail to some extent with those of Dr. B. M. Nicol reported in last week's *Journal* (page 177). The latter found that attacks of malaria occur, though not with equal frequency, among people taking proguanil, mepacrine, or quinine. When given in correct dosage the complete effectiveness of mepacrine as a suppressant has been proved beyond doubt. In fact during the last war members of the Forces who developed malaria in areas in which mepacrine suppression was in force could be charged with indiscipline for failure to take the drug. In Nicol's series, out of 21 persons who stated that they were taking mepacrine regularly 14 said that while doing so they had had malaria. If the malaria in these 14 patients was correctly diagnosed their statements that they had taken the drug regularly must be considered unreliable. In view of this, the claims of those taking other drugs must be suspect. Nevertheless such studies are useful, for they show how much the drug can accomplish in spite of what is almost certainly irregular dosage.

The absolute capacity of a drug to suppress an infection can be assessed only under strictly controlled conditions. Nicol appreciated this and emphasized that his information was dependent upon such doubtful factors as the patient's memory and knowledge of the method of diagnosis in his or her case. It is, however, clear from his study that in spite of human inconsistency individual prophylaxis with proguanil is highly effective, only 6 out of 203 individuals taking 100 mg. of the drug daily having had proved attacks of malaria. Suppression was much less satisfactory in those taking mepacrine or quinine.

In investigations of the therapeutic efficacy of antimalarial drugs the most important point to determine is the effect of the drug in non-immune persons who, preferably, have not been to the Tropics. If the results of drug treatment are satisfactory in them, then they must also be satisfactory in those in whom its action is assisted by immunity. In asserting that two of his patients required intramuscular quinine Lieutenant-Colonel Taylor raises a matter which was discussed in the correspondence columns of this *Journal* during the latter part of 1951 and early in 1952. The position was summarized at the time in an annotation.[3] Sir Philip Manson-Bahr also discusses the use of quinine in his letter at page 284 and inquires why it has of recent years been relegated to obscurity. To this surely the answer is clear. If speed of action is required quinine must give pride of place to chloroquine, while for prophylaxis it is known to be incompletely effective against *P. falciparum* and to engender blackwater fever. It seems that Sir Samuel Gee's utterance needs modifying to "Go on using your

[1] Goodwin, L. G., *British Medical Journal*, 1952, 1, 732.
[2] Coatney, G. R., *et al.*, *Trans. R. Soc. trop. Med. Hyg.*, 1952, 46, 496.
[3] *British Medical Journal*, 1952, 1, 590.
[4] Fairley, N. H., *ibid.*, 1949, 2, 891.

drugs as long as they cure, but don't cling to those that sometimes kill when you have found others to work safely."

For the treatment of acute attacks of malaria chloroquine appears to be the most rapidly acting drug[4] and for fulminating or cerebral *P. falciparum* infections is best given intravenously in a saline drip. Intramuscular or intravenous mepacrine is probably the most satisfactory alternative to chloroquine, but the use of quinine in these cases is inadvisable in view of the risk of blackwater fever, and pyrimethamine and proguanil should also not be given unaided for such infections, as Sir Gordon Covell has recently emphasized in a letter to this *Journal* (July 4, page 41). For malarial suppression proguanil is the drug of choice, for it combines effectiveness with absence of toxicity, while it is the only drug known to be a true causal prophylactic in *P. falciparum* infections. It may be found that pyrimethamine also has such an effect against this parasite and *P. vivax*. If this is so, it will mean that a drug has at last been found which when taken prophylactically prevents late relapses of benign tertian malaria. Finally, it cannot be too firmly stressed that quinine should not be used for suppression. In maximally tolerated doses it has been found to be ineffective and to lead to latent or to recrudescing infections in the presence of which blackwater fever is liable to develop.[4] An important result of the introduction of the modern antimalarials is that in communities in which they are used in proper dosages blackwater fever is abolished. This in itself has led to great saving of life.

THE PLACE OF THE HOSPITAL

The administrative structure of the National Health Service has been the subject of much comment and criticism since the Acts creating it were passed, and five years' experience of its working has shown that much of the criticism is justified. In his Croonian lectures published in this and last week's issues of the *Journal* Sir Allen Daley sets out his reflections on some of the problems confronting us in the light of these first five years of the N.H.S., and he maintains, "It is recognized generally that a weakness of the new Service is the division of its administration into three separate compartments." There will be much support for this point of view, but far less support for the solution which he propounds—namely, to go back to the Willink proposals for a number of joint area authorities for hospital services.

Sir Allen surveys the scene as a former medical administrator with a special interest in preventive medicine, and sees "no clear or logical line of demarcation in the present distribution of function between the three branches of the Service." He considers the tripartite separation of functions between hospitals, general practitioners, and local health authorities as artificial and illogical, and shows how efficiency is impaired by such separation when close integration is so essential—in the prevention and control of infectious disease, in tuberculosis, in the care of the chronic sick, in mental health, and in the maternity services, where the "interlocking of function is most pronounced." Another difficulty he points out is in deciding whether a person is aged and infirm or can be regarded as one of the chronic sick, and he says, "However broad the dividing line, one must be fixed somewhere, as a hospital authority cannot be expected to provide accommodation for the aged and infirm, though when local authorities were responsible for both hospitals and welfare institutions the exact definition was not of great importance." And now there is the further complication that if the hospital authority accepts the patient no charge is made, whereas if the local health or welfare authority does so the patient is assessed for payment. He also sees "a change which is not an improvement and which follows the thesis that hospitals are responsible only for patients for whom treatment is likely to be beneficial, and if no further benefit is likely they become the responsibility of the local health authority."

In view of these difficulties, and the tendency to isolate the general practitioner from the hospital, everyone will agree with Sir Allen's observation that "all who work in it should realize that there is only one National Health Service, and that all proposals for development and change should be discussed with representatives of the other services whose own work in some way or another is likely to be affected." At this point Sir Allen says, "Some may feel that the only logical solution of all these administrative difficulties is to have for each area one, and only one, body responsible for the administration of all three branches." He recognizes, however, that the practical difficulties at this stage are insuperable, but feels that it is not unrealistic to go back to the Willink proposals, which would ensure a much closer association of the hospitals with the other two branches of the Service. This is related to the thorny problem of the reorganization of local government boundaries, which would in itself greatly help co-operation between the hospital services and those of local government. Sir Allen's observations on unifying the administrative structure should be studied very carefully. It is a problem that will sooner or later have to be faced, with the associated problem of whether the unified administrative body should be elected or nominated.

[1] *British Medical Journal*, June 6, p. 1268.

Meanwhile what is to be done to encourage a greater sense of unity in the Service, and how in particular can the hospitals help? This is a challenge to those working in the Service to try to overcome the weaknesses in the present administrative structure. Any interim solution which multiplies the amount of time spent on paper work and increases the existing plethora of committees is rightly condemned. Formal meetings are not essential for this type of co-operation, and much can be done by personal consultation even on the telephone. The hospitals have an important part to play in this integration, but the "hospital is not the centre of gravity of the Service any more than the general-practitioner service or the public health service is the centre of gravity." The tripartite partnership is one of equality of status.

Observing that hospitals should take a more active part in preventive work—a theme discussed in these columns recently[1]—Sir Allen points out that "there can be no clear-cut line of demarcation between the work of hospital and health authorities so far as preventive and curative medicine are concerned." The special hospitals, of which there are many, have a role quite as important as that of the acute hospitals, and, in the planning of hospital facilities for the chronic sick, chest cases, mental defectives, and so on, he pleads for a closer association between the hospital board, general practitioners, and public health officers. By associating at the planning stage, all the partners in the Service will gain in understanding each other's needs. He agrees too with those many critics who have contended that general practitioners should have hospital beds in their charge, that they should have prompt reports, access to pathological and radiological facilities, and be welcomed in the hospitals. Not only is the patient thus benefited, the doctor is helped to keep up to date. Hospitals should also make full use of the services of the medical officer of health in the prevention and control of infectious disease, and should join with him in research into the amount and nature of the sickness in the community. In these and many other ways Sir Allen feels that hospitals should play their part in the preventive services and "supply the needs of the other two branches of the Service."

These lectures should be closely studied by everyone concerned with the running of the Service, for apart from Sir Allen's main thesis, outlined here, he makes many pungent and timely comments obviously intended to be controversial on a variety of topics. As to regional boards, for example, he avers that "many think there are too few, that the original conception of between thirty and forty would have been better." Discussing the functions of the Ministry of Health, he states that it "undertakes to an increasing extent executive responsibility and issues directives about the management and staffing of hospitals." And he poses, but avoids answering, the question whether this is a more tolerable method of control than the former executive control of local authority hospitals by the local authorities and their officers.

CHRONIC BRONCHITIS

Now that rickets has ceased to be a major problem its characterization as the English disease might well be transferred to chronic bronchitis, which alike appears to be a typical product of the English weather and murky towns. As a cause of death, sickness, and chronic disability it is of primary importance, and it is anomalous that as a subject for research it has until recently been accorded scant attention. The report in our opening pages this week by N. Goodman, R. E. Lane, and S. B. Rampling, from the Nuffield Department of Occupational Health, Manchester, draws attention to those outstanding epidemiological features of the disease which are likely to prove the most fruitful starting-points of a search for methods of prevention.

That the disease is commoner in Britain than in some other parts of the world is shown by comparison, for instance, with Scandinavia. For men aged 50 to 60 the death rate from bronchitis in 1948 was 50 times as high in England and Wales as it was in Norway and Sweden. But the incidence is not equally high in all parts of Britain, nor in all sections of the population. It is two to three times higher in towns than in the countryside, and twice as high in the north and west as in the drier south and east. According to the Registrar-General's occupational mortality statistics the disease is five times as common among both men and married women of the poorest economic class as among members of the professions. The explanation of this may lie in the overcrowding and consequent greater ease of infection associated with poverty. The origins of the disease may perhaps be found in the conditions under which infancy is passed—when, for example, respiratory infections are so common among the children of the poorer-paid citizens. It is striking that, in Britain, the chronic disease appears principally in men, even though morbidity data all agree that the acute condition occurs equally in both sexes, if indeed not more often in women. The difference may, perhaps, be due to constitutional factors, but it is certainly worth inquiring whether alternatively it may not be due to the different work habits of men—the greater physical effort undertaken by some whilst still suffering an acute infection—or to their different smoking habits.

With the experience of last winter's fogs fresh in the memory it cannot be doubted that atmospheric pollution is responsible for aggravating the disease and for hasten-

[1] *Quart. J. Med.*, 1953, n.s. **22**, 121.
[2] *Lancet*, 1952, **2**, 1206.

ing the death of a large number of sufferers. But whether it is responsible for starting the disease is a question on which there is at present no evidence. Until proved otherwise (if it ever is), pollution of the air must be regarded as a likely cause of the first importance. Similarly fresh—often virus—infections are clearly responsible for a high proportion of acute exacerbations, although, to quote Stuart-Harris and his collaborators,[1] "No one has ever found an infective agent which could with confidence be described as an actuating cause." They found that pneumococci were frequent inhabitants of the sputum in all phases of the disease, but that the types came from the whole range of the species, and the distribution resembled that found in the healthy nasopharynx more closely than that in the sputum in cases of pneumonia. In the past it has been suggested that *Haemophilus influenzae* might be of particular importance, and May[2] has recently confirmed this possibility. He realized that the apparent variation in the predominant organisms in the sputum might be due to irregular distribution, so that the appearance of any particular one might be determined largely by chance in the selection of the portion of sputum for culture. By a system of random sampling of the sputum he found that both those organisms which have seemed to be responsible for the infective element of the disease—*Haemophilus influenzae* and *Pneumococcus*—are those which are distributed most irregularly and so most likely to be missed on occasions. Chemotherapy designed to eliminate them can give much temporary relief of symptoms. But no method has yet been found which will prevent reinfection as soon as the patient returns home and is exposed to the family cold.

DIAGNOSIS OF POLIOMYELITIS

The rising incidence of poliomyelitis, illustrated at present by a graph every week in our Vital Statistics section, means that many family doctors will have the anxiety in the next two months or so of considering whether one of their patients has the disease. The earlier the diagnosis, the more effective can be the measures taken to mitigate the consequences of the infection. The patient's life, indeed, can depend on early treatment.

Two phases of the disease may be distinguished. The first of these is called the minor illness. It represents the body's response to infection and concludes the incubation period of about seven to ten days (or occasionally longer). The symptoms are similar to those of many other acute infections, and commonly include headache, malaise, and shivering. There may also be sore throat and perhaps gastro-intestinal disturbances. Pyrexia may be slight, and together with malaise may be the only manifestation of infection. The inference that the infection is poliomyelitis may sometimes be drawn when a patient is known to have been in contact with a recognized case. The family doctor faced with such an early case may wonder whether the patient should be isolated at home or sent into hospital, and whether or not the case should be notified. The medical officer of health may be asked to take the responsibility to decide. Many cases end with this phase, the attack then being termed abortive. A few go on to the so-called major illness, when paralysis may or may not occur.

The principal disturbances in the major illness are meningeal. Headache is almost invariably present and is usually supra-orbital and persistent. Vomiting, often repeatedly, is very common. Alertness, apprehensiveness, and sleeplessness are notable rather than drowsiness. Certain signs may be elicited, of which the most important is stiffness of the posterior cervical and back muscles. The neck and back may be poker stiff, but the head is not retracted. Kernig's sign is often present. Neck or back stiffness may be so slight as to be detected only by the patient's inability to kiss his bent knees. Differential diagnosis at this stage is from pyogenic meningitis and, if the cerebrospinal fluid is lymphocytic, tuberculous meningitis; but the possibility of other virus infections of the meninges should also be borne in mind. Epidemic myalgia (Bornholm disease)[1] may be of increasing importance in the differential diagnosis. Meningismus can be misleading; there the C.S.F. is normal, but so it may be occasionally in poliomyelitis. Other common causes of error are local inflammation in glands or tissues of the neck giving rise to an impression of meningeal rigidity. Some patients are found on further observation to have rheumatic conditions.

When paresis or paralysis occurs, it is rarely seen earlier than 48 hours after the first symptoms of the major illness. When gross and asymmetrical, with weak or absent reflexes, there is rarely difficulty in diagnosis. Slight pareses are very easily missed. Paralysis may spread for several days after its first appearance. When paralysis is quite symmetrical and associated with some sensory impairment, a toxic cause should be suspected. Brachial radiculitis is not uncommonly confused with poliomyelitis. In hysterical paralysis the tendon reflexes remain active. Many cases of pseudo-paralysis are also seen—in the immobilization, for example, caused by osteomyelitis or rheumatism.

Apart from the diagnosis of the disease, the early recognition of serious complications may be life-saving. In the bulbar type death often occurs from the patient's inability to keep his airway free from secretions. Speech difficulty and weak cough may indicate the necessity for prompt postural drainage. Weakness of the shoulder girdle may point to respiratory muscle paralysis. This should be carefully investigated, for it may be insidious in onset and later rapidly progressive. An increasing tendency to sleeplessness and apprehension may suggest this complication, and a simple test, such as the patient's incapacity to count far in one breath, may demonstrate it, as also will a feeble cough. Finally, urinary retention due to temporary bladder paralysis is common, especially when the lower extremities are involved, and is apt to be overlooked.

[1] *British Medical Journal*, June 20, p 1379.

THE KING'S FUND

Apart from its "rich uncle" role, the King Edward's Hospital Fund for London has had a co-ordinating influence on hospital affairs in London and has helped hospitals to find practical solutions to their problems. If the Fund had not been in existence when the hospitals were nationalized some other body would have had to be created, probably on not nearly so good a pattern nor so rich in resources, to stand for the partnership between the State and voluntary service in hospital administration. Although it has made large grants and appropriations—£271,000 under these headings in 1952—the Fund has never been a mere distributor of largesse. Nor has it, since its earliest years, ever entered the field in competition with individual hospitals for subscriptions. Subscriptions are certainly welcomed, but the income from subscriptions and donations last year was only £11,500. From legacies—and there are indications that testators who would formerly have left their money to individual hospitals are now making the Fund their beneficiary—it received £65,000. But its income from investments and properties was more than one-third of a million. The Annual Report for 1952 sets out the various purposes for which grants have been made—purposes which are often designed to make life in hospital more agreeable for the patients. For instance, many hospitals have been helped to improve their gardens, often with the co-operation of the Royal Horticultural Society. The Fund also maintains important services for the benefit of hospitals collectively, such as the Emergency Bed Service, the Hospital Administrative Staff College, and the School of Hospital Catering. New ground was broken last year in the organization of courses in administration for trained nurses. Another new enterprise of the Fund is the setting up under the wing of the hospital service of convalescent homes for the aged sick. A sum of £350,000 has been set aside for this purpose. The plan is for twelve homes, all in the environs of London. Seven are open and three others are being built. All four Metropolitan Regional Hospital Boards have agreed to meet the maintenance costs. Each home is linked with a hospital where the medical staff is actively interested in the care of the elderly. All are managed by voluntary organizations, the lion's share being borne by the British Red Cross Society. The idea is to facilitate the patient's discharge from hospital, rather than to provide beds for the chronic sick. The first of the homes, with 30 beds, admitted 222 old people during the first 22 months of its existence. The capital cost for the first seven homes was £870 for each bed.

The control of hospital expenditure is a subject which has been discussed recently, and the report points out the three alternatives—curtailment of services, reduction of standards of service, reduction of expenditure. No hospital would wish to adopt the first or the second. Whether the third is possible remains to be seen, but the author of this report evidently thinks something can be done to reduce duplication and overlapping, which have wasted capital and greatly increased maintenance costs. The report continues: "Has not the time arrived for a backward swing of the pendulum; the time to resolve the balance of functions; the time for hospitals to ask not, 'How much more can we get to spend?' but, "How much can we reduce our demands?'"

EATING BEHAVIOUR

Provision for feeding industrial workers in canteens has made immense strides in recent years, and this has brought with it many problems, of which the most obvious are dietetic and economic. It is surprising that until recently these problems have not been studied in their social context. The significance of the meal as a social occasion as well as a means of refuelling the human machine should have been plain enough to the business man, who could have obtained useful advice on the subject from any group of housewives. But by and large the "industrial caterer" has been content to go his own way and to try to develop an efficient service by studying such relatively simple questions as refrigeration, protein content of various foods, and so on, rather than problems of how to feed A and B, regarded as human beings rather than experimental subjects.

This is simply not good enough, because different kinds of workers take advantage of canteen services in different ways. For instance, Cook and Wyndham,[1] in a report of a recent study of the subject carried out in Australia, point out that administrative staff tended to use canteen services much more often than production staff. As this preference could not be satisfactorily explained in terms of economics, an investigation was made into the circumstances in which the worker feels "at home" in the more intimate moments of feeding, and it was found that they varied greatly from one group of workers to another. The point is an important one, and investigations carried out to discover what domestic arrangements should be made in works canteens may lead us a long way to understanding social phenomena about which we now know much too little. The task thus set may prove to be unexpectedly difficult—and unexpectedly rewarding—for no elaborate psychiatry is needed to show that complaints about canteen food or seating arrangements may be symptoms of much more profound tensions in industrial relationships. The maxims that restful surroundings promote good digestion and that good feeding promotes good work are simple, but their practical application may be intensely complicated.

The Australian report discloses that upholstered seats were reserved in the canteens for administrative workers—a somewhat surprising fact that hardly tallies with the popular conception of Australian social behaviour. We are left in doubt whether this had anything to do with the unpopularity of the service to the industrial workers. The final conclusion appears to be the unsatisfactory one that "it all depends." Even so, grumbling about quite good food is frequent enough in British factories. It is usually taken to be a symptom of bad morale, but the problem is rarely probed at all deeply.

We record with regret the death on July 26 of Dr. Mervyn Gordon, consulting bacteriologist to St. Bartholomew's Hospital. He was 81 years of age.

[1] Cook, P. H., and Wyndham, A. J., *Hum. Relat.*, 1953, **2**, 141.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

CORTISONE AND A.C.T.H.—I

BY

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The administration of A.C.T.H. or cortisone raises the concentration of adrenal cortical hormone in the circulating blood and presumably also in other body fluids. This may be of very great benefit at certain stages in a variety of disease states, but why this should be so is still by no means clear.

There is abundant evidence that animals and indeed humans without adrenal glands resist the stresses of trauma, infection, toxic substances, and adverse environmental conditions much less well than do those with healthy adrenal tissue. There is also plenty of evidence that the adrenal cortex is very readily stimulated by such stresses to liberate increased amounts of adrenal cortical hormone into the blood stream. Even psychological stress will produce this result: screwing up one's courage, for instance, involves such adrenal cortical stimulation. It would seem that the increased concentration of hormone in the blood helps the cells of the body to resist adverse trends in the internal environment, though how this is achieved is unknown. It may be that the adrenal hormones strengthen the cell membrane or lower its permeability. It has been suggested that the adrenal cortical hormones provide the cells "with an asbestos suit protecting them from the fires of infection." Although such a statement explains nothing, it nevertheless provides a useful working concept of what it is hoped to achieve by therapy with A.C.T.H. or cortisone. Such a concept takes no account of specific diseases; it merely considers disease in general as a damage to the tissues of the body. But this is the proper way to regard the use of cortisone. The results of therapy are quite empirical and little is to be gained from pushing theory further than this simple generalization.

A substance with so fundamental an action brings its own responsibilities: it must not be given indiscriminately. By protecting against disease, it may reduce or eliminate some of the traditional signs or symptoms of disease. Thus the temperature associated with infection may be reduced to normal, even though the infection itself persists or even extends; the malaise of a toxaemia may be eliminated, even though the disease causing it is unaffected; the sedimentation rate, an important clinical sign of disease, may be reduced to normal. With all these improvements in the state of the patient a false sense of security may be produced in those in whom the disease process is not actually under control. Perforation of gastric ulcers and extensive peritonitis have occurred in patients on cortisone, and have remained undiagnosed because the traditional indications of the catastrophe were masked. Because of such dangers, it is of great importance that a complete diagnosis should be made before cortisone or A.C.T.H. therapy is attempted. These drugs should never be given as a last resort to patients with undiagnosed disease who appear to be resistant to the more usual forms of treatment. They must not be regarded as the last refuge of the therapeutically destitute. Cortisone and A.C.T.H. are not known to cure any disease: they only alleviate some of the manifestations; other aspects of the disease process may remain unaffected, and to these the patient may still succumb, in spite of full cortisone therapy.

As already stated, the essential process in A.C.T.H. or cortisone therapy is to raise the concentration of adrenal cortical hormone in the circulating blood. The hormone concerned is very probably a steroid called compound F (17-hydroxycorticosterone). Its chemical formula is known and it can be manufactured. It can be detected in small amounts in blood or body fluids and occurs in higher concentration in the blood of the adrenal vein. Although cortisone itself, which is a mildly oxidized relative of compound F, is probably absent from circulating blood, it has very much the same physiological actions as the natural hormone. It is likely that cortisone acts by being converted into compound F within the body. When compound F becomes available commercially it will probably prove even more effective than cortisone.

Principles of Therapy

Cortisone is usually supplied either as tablets of acetate to be taken by mouth, or in the form of a suspension of finely divided crystals of cortisone acetate in a saline medium, suitable for intramuscular but not for intravenous injection. It is stored at room temperature.

When cortisone acetate is taken by mouth it is quickly absorbed and the therapeutic effect is rapid, but the amount in the blood falls back in a few hours to its original level. It is therefore best given twice a day or oftener. Cortisone acetate injected intramuscularly behaves differently. It is relatively slowly absorbed and much will often persist at the injection site after 12 or 24 hours. If daily injections are given, more and more will collect at the injection sites, producing a depot of cortisone which is only slowly absorbed. Blood levels will thus rise more slowly than with oral cortisone, and the maximum effect may not be attained until injections have been given for several days. When injections cease, absorption will often continue from these depots for a week or more. Therapeutic effect will thus diminish gradually. The cortisone acetate suspension can be given orally if desired. It is readily taken mixed with a little milk, and is then rapidly absorbed.

When cortisone is administered by either method the patient's own adrenal glands tend to be inhibited and gradually pass into a state of disuse atrophy. This is not a serious matter if cortisone continues to be administered, but if therapy is suddenly stopped the patient may find himself without either administered or self-produced hormones and may pass temporarily into a state like Addison's disease. To avoid this risk the dose should be tailed off gradually so as to give the patient's own adrenals an opportunity to resume normal function. Tailing off is probably the more necessary when cortisone is given orally, because with injected cortisone the depot effect provides for this to some degree.

Adult dosage of cortisone varies according to circumstances from 25 mg. to 200 mg. per day.

A.C.T.H., or adrenocorticotrophic hormone, is a highly purified protein fraction of the anterior pituitary lobe of cattle or other animals which has the unique power of stimulating the adrenal cortex to greatly increased activity, to hypertrophy, and to much augmented production of its

own hormones. It is stable in the dried state and is readily soluble in normal saline or water. Like most protein-type therapeutic substances, it is destroyed by the digestive juices of the stomach and small intestine, and so is inactive when taken by mouth. It must therefore be administered by parenteral injection, either intramuscularly or intravenously.

When A.C.T.H. enters muscle some of it is probably destroyed locally and some enters the blood stream to pass ultimately to the adrenal gland. Circulating A.C.T.H. is unstable and is fairly rapidly destroyed, probably within 15 minutes. It follows that when A.C.T.H. is injected intramuscularly only a small part becomes available for adrenal cortical stimulation: perhaps two-thirds or more of the total is destroyed either locally or in the blood stream. Not only this, but an injected dose is available for only a relatively short time, and adrenal stimulation probably starts to subside an hour or two after the injection. There are several methods for overcoming this difficulty. Injections may be repeated at frequent intervals; for this purpose, four times in the 24 hours is usually recommended. A given daily dose of A.C.T.H. produces considerably greater stimulation when given in divided doses over the day than when given as a single daily injection. A second method of producing more continuous stimulation is by a process analogous to that with zinc protamine insulin. A.C.T.H. can be incorporated in a gelatin base, and the resultant gel, which becomes fluid on gentle warming, is protected from rapid destruction after injection and is liberated slowly from the injection site over a number of hours. With this gel a single daily injection can provide continuous gentle stimulation of the adrenal over the greater part of the 24 hours. The third method is to administer the A.C.T.H., dissolved in saline, as a slow intravenous drip over a period of six to eight hours a day. A prompt response is obtained and the efficacy of a given dose is increased by 5 to 15 times, an important point where supplies are restricted. Though this is a very economical method of administration it clearly has several disadvantages. It is unsuitable except for patients confined to bed and in hospital; it needs constant supervision, is an encumbrance to the patient, and may occasionally lead to venous thrombosis. Although all three methods are still in use, the daily injection of A.C.T.H. gel is generally the method of choice.

Obviously A.C.T.H. will have no clinical effect if the adrenal cortex is diseased, as in Addison's disease, or if for any other reason it is unable to respond. Although in the great majority of patients the adrenal cortex is responsive, yet it is desirable to have some indication that this is so. It is most readily done by carrying out eosinophil counts; if a sufficient output of adrenal hormones has been achieved the eosinophil count will fall practically to zero. A check such as this is of considerable value during A.C.T.H. therapy, since in addition to adrenal unresponsiveness it occasionally happens that the sample of A.C.T.H. is either inactive or of low activity. In suitably equipped hospitals, observation of a rise in output of 17-ketosteroids or of so-called 11-oxysteroids is an additional check on the activity of the A.C.T.H.

When, after a course of injections to which the patient has responded, the A.C.T.H. is stopped abruptly, the hypertrophied and over-acting adrenal cortex is suddenly deprived of its stimulus. It is liable then to become inactive for a few days, and in this period, as with cortisone, adverse withdrawal phenomena may occur. The dose of A.C.T.H. should therefore be tailed off gradually to a low level before finally stopping treatment.

Contraindications to Therapy

Perhaps the most important single contraindication is ambiguity of diagnosis. Great harm may be done by giving these drugs to unsuitable patients. An improvement in well-being and indeed a euphoria, with fall in temperature and sedimentation rate and possibly some gain in weight, may easily give an entirely erroneous impression that the drug is doing good, thus diverting attention from the need for treatment by more traditional and orthodox methods. Undiagnosed fevers and abdominal disorders of uncertain nature are examples where the drug should in general be avoided.

The second major contraindication is ignorance on the part of the physician of the physiological effects of the drugs. There are certain overdosage effects which should always be watched for, and these are considered below. They are all very real, and more harm than good may be done if any of them are allowed to develop too far unchecked.

In certain clinical states A.C.T.H. or cortisone should be given with special caution, and preferably only by those already experienced in its use and in the dangers of overdosage. Important among such relative contraindications are congestive heart failure with oedema, diabetes mellitus, and hypertension if it is already producing symptoms. Special caution is also necessary in any person who shows or has shown evidence of a psychopathic personality, as this can easily be made worse or a latent abnormality may become manifest.

Since A.C.T.H. is effective only by virtue of its stimulation of the adrenal cortex, it should not be expected to succeed in patients with seriously diseased adrenal glands, as in Addison's disease. Conversely, in states of adrenal hyperactivity, such as Cushing's syndrome, further stimulation with A.C.T.H. will only aggravate the disorder.

Particular caution is necessary in giving the drug to any person with active or latent tuberculosis, as there is considered to be danger of lighting up the activity.

Metabolic and Overdosage Effects

The same general metabolic effects are produced by both cortisone and A.C.T.H., but overdosage phenomena are rather commoner with A.C.T.H. because the response to a given dose of A.C.T.H. varies considerably from person to person. There is a mild but appreciable tendency to sodium and water retention during the first few days. Occasionally this may be sufficient to produce manifest oedema; in persons who are in any way sensitive to sodium retention, such as those with early congestive failure, signs of aggravation such as weight increase or rise in jugular venous pressure must be carefully watched for. If any adverse tendency is detected or even suspected, it will usually be wise to restrict the sodium intake, at least during the period of early therapy.

The drugs also cause a tendency to increased renal loss of potassium. In prolonged intensive therapy this may become sufficient to be of clinical importance. Muscular weakness and electrocardiographic changes may suggest an excessive potassium loss. Since potassium deficiency may be insidious in onset and difficult to detect, it is wise to ensure an adequate intake by supplementing the ordinary diet with 2 or 3 g. of potassium chloride. There may be also an increased calcium excretion in the urine. This is seldom of any clinical significance, but in patients with disturbed calcium metabolism, such as those with the steatorrhoea of non-tropical sprue, attacks of tetany have occasionally been provoked.

Carbohydrate metabolism is profoundly altered by these drugs. Sensitivity to insulin is decreased so that the blood sugar tends to rise, and in the established diabetic insulin requirements may be temporarily but very considerably increased. For this reason it is wise to be very cautious in administering the drugs to known diabetics. Their effect on blood sugar may be sufficiently great in non-diabetics to produce glycosuria. Such glycosuria is not, by itself, adequate reason for lowering or stopping dosage.

Adrenal cortical stimulation also usually involves the increased production of adrenal androgens. This may lead to mild evidence of masculinization in females, with a tendency to acne, amenorrhoea, or even hirsutism. These androgenic effects are usually negligible unless therapy with A.C.T.H. is intensive and prolonged. They are promptly reversed when treatment is stopped, and are not usually reasons for curtailing it.

Less clearly related to the known effects on metabolism are the psychological changes. The improvement produced by the drugs in a susceptible disease such as rheumatoid arthritis is so marked that a dramatic increase in well-being and optimism is to be expected. Yet the mental stimulation and optimism, amounting to frank euphoria, often occur to a degree far in excess of what can be accounted for by such physical improvement. They appear largely to be direct effects of the drugs themselves and may occur even when the disease process has in no way been affected. Thus one scientist patient with advanced myeloid leukaemia was stimulated to plan many new scientific activities although no alleviation of his leukaemia occurred and he was dead within a week. In people of different make-up there may be depression rather than euphoria. This depression, together with insomnia, may become progressively more severe until frank psychotic tendencies become apparent. Though these mental changes are usually reversible, they should call for a careful review of therapy, and in general the dosage should be reduced.

[*Part II will appear in our next issue.*]

Refresher Course Book.—The first collection of articles of this series (fully revised) are available as a book containing 55 chapters, price 25s. Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

3-D AT CARDIFF

A three-dimensional surgical film in colour was shown at the Annual Meeting in Cardiff, presented by Ethicon Suture Laboratories. Entitled *Mediastinal Tumours*, it was made in Washington and was projected by special equipment lent from America. Each member of the audience was equipped with light polaroid spectacles, and there seemed to be few, if any, complaints of headache or visual discomfort. The film showed the surgical technique for the removal of such tumours in considerable detail, two operations being demonstrated, one for a thymoma by a left approach, the other for a cyst above the right diaphragm. The three-dimensional effect greatly enhanced the film's usefulness, especially as its subject lay within a body cavity. The relations of the various structures were immediately seen, and the highlights reflected from the moist organs were no longer the source of confusion they often were in two-dimensional films.

The film included a good spoken commentary, mostly descriptive of the steps being performed but interspersed with some general observations on the subject, such as the acceptable advice that all patients with mediastinal tumours should be subjected to exploratory thoracotomy, and that aneurysm can most reliably be excluded by angiocardiography.

Advantages of Stereoscopic Effect

The film lasts about 40 minutes, and thus for most purposes is unnecessarily long. The experienced surgeon will learn little from it, for the operations are among the simplest performed within the thorax, and the ordinary doctor would probably have preferred more clinical or pathological facts and less technique. These are minor criticisms, applicable to a great many medical films. No doubt the film is directed especially at the trainee surgeon—a small group for whom it is ideal. Other audiences will probably be more interested in the film itself than in its subject. The stereoscopic effect is a definite advance, making the surgical technique notably easier to understand and visualize. This film, indeed, gives a clearer view than that obtained by most visitors to a crowded operating theatre, and others by the same process, perhaps showing more complex operations, or new ones, will be warmly welcomed—especially if condensed versions, omitting all but essential details, are available for showing to practising surgeons.

SUPPLEMENTARY LIST OF APPROVED NAMES

The General Medical Council has authorized the following "approved names" selected by the British Pharmacopoeia Commission. The list supplements the consolidated list of names published in January and the supplementary list printed in the *Journal* of April 18 (p. 882).

Approved Name	*Other Names*
Bromazine	2 - (4 - Bromodiphenylmethoxy) - ethyldimethylamine. "Ambodryl."
Carbimazole	2 - Carbethoxythio - 1 - methyliminazole. "Neo-mercazole."
Cetomacrogol 1,000	Polyethylene glycol 1,000 monocetyl ether.
Chloropromazine	3 - Chloro - 10-(3-dimethylaminopropyl)-phenothiazine. "Largactil" is the hydrochloride.
Dextromethorphan	(+) - 3-Methoxy-*N*-methylmorphinan.
Dextrorphan	(+) - 3-Hydroxy-*N*-methylmorphinan.
Dihydrallazine	1 : 4 - Dihydrazinophthalazine. "Nepresol."
Dimenhydrinate	8-Chlorotheophylline salt of (2-diphenyl - methoxyethyl)dimethylamine. "Dramamine."
Hydrocortisone	17-Hydroxycorticosterone. "Hydrocortone."
Insulin zinc suspension	Insulin lente.
Insulin zinc suspension (amorphous)	Insulin semilente.
Insulin zinc suspension (crystalline)	Insulin ultralente.
Iproniazid	*N* - *iso*Nicotinoyl - N' - *iso*propylhydrazine.
Isophane insulin	NPH insulin.
Levomethorphan	(−) - 3-Methoxy-*N*-methylmorphinan.
Levorphan	(−) - 3-Hydroxy-*N*-methylmorphinan. "Dromoran" is the tartrate.
Macrogol 4,000	Polyethylene glycol 4,000.
Macrogol 400	Polyethylene glycol 400.
Methoxamine	β - Hydroxy - 2 : 5-dimethoxy-α-methylphenethylamine. "Vasylox" is the hydrochloride.
Neomycin	An antibiotic produced by a strain of *Streptomyces fradiae*.
Noradrenaline	(−) - 2-Amino-1-(3 : 4-dihydroxyphenyl)ethanol. (−)-Noradrenaline. "Levophed."
Oxytetracycline	An antibiotic produced by *Streptomyces rimosus*. "Terramycin."
Phenylindanedione	2-Phenylindane-1 : 3-dione. "Dindevan."
Pholcodine	2'-Morpholinoethyl ether of morphine. "Ethnine."
Primidone	5-Ethylhexahydro-5-phenylpyrimidine-4 : 6-dione. "Mysoline."
Propantheline	2'-Di*iso*propylaminoethyl xanthen-9-carboxylate. "Pro-banthine" is the methobromide.
Racemethorphan	(±) - 3-Methoxy-*N*-methylmorphinan.
Racemorphan	(±) - 3-Hydroxy-*N*-methylmorphinan.
Salicylamide	*o*-Hydroxybenzamide.
Sodium antimonylgluconate	Sodium salt of a trivalent antimony derivative of gluconic acid. "Triostam."
Stibamine glucoside	*N*-Glucosyl derivative of sodium *p*-aminophenylstibonate.
Thurfyl nicotinate	Tetrahydrofurfuryl nicotinate. "Trafuril."
	Amendments
Sodium Stibogluconate	Sodium salt of a quinquevalent antimony derivative of gluconic acid. "Pentostam."
Ethyl methimazolate	This Approved Name is now replaced by Carbimazole (see above).

MEDICAL LIBRARIANSHIP

FIRST INTERNATIONAL CONGRESS

The first International Congress on Medical Librarianship was held in London from July 21 to 25, and was attended by delegates from over thirty countries as well as by representatives of international organizations. After an inaugural session there were symposia on the role of the medical librarian in the world, on education and training for medical librarianship, on the centralization of medical library resources, and on international co-operation in this field. Other events of the Congress included visits to the medical libraries of London and various exhibitions.

Sir CECIL WAKELEY, in a brief presidential address in the Beveridge Hall of the University, said that in his capacity as President of the Royal College of Surgeons he was closely concerned with one of the largest and most frequented medical libraries in London; as a medical editor he was vitally interested in medical bibliography and documentation; and as a practising surgeon he had long known that "some of the finest consultants available are to be found in medical libraries"—not only in the shape of the volumes on the shelves but of the librarians at the desks. Medical librarianship, he said, was a highly specialized subject and one admirably suited for an international congress. The medical librarian, who was not merely a librarian with some knowledge of medicine or a physician who was fond of books, was now taking his proper place in the world of scientific medicine and research. It was the ever-increasing complexity of modern medicine and the constantly growing bulk and variety of its literature which had given the medical librarian his place. The exhibition of medical periodicals of the world at the headquarters of the British Medical Association (*Journal*, July 25, p. 233) comprised some 2,500 journals, and he was told that there were 1,500 current medical periodicals which it had not been possible to include. For his own part he found this unique array of journals, in all languages and covering every department of medical knowledge, not only impressive but a little frightening.

Some thread by means of which they could find their way in and out of this labyrinth, Sir Cecil Wakeley continued, was provided by the Armed Forces Medical Library at Washington in its *Current List of Medical Literature*; but no single body could be expected to bear such an exclusive responsibility for long, and it was one of the objects of that Congress to hammer out ways of inter-library and international co-operation so as to spread the load. Perhaps a means might be found by which each country would be able to produce rapidly a current index to its own medical literature, and all the national indexes might then be assembled and reissued by one of the great international agencies such as the World Health Organization or Unesco.

In the Congress attention would be paid to the fundamental problem of the recruitment and training of the medical librarian. The curriculum which the librarian now had to pursue and the examinations which he must pass before he was entrusted with a medical library of any importance ensured that his specialty took a fitting place among the other specialties of medicine. The Congress, he said in conclusion, afforded a unique opportunity of serving the medical libraries of the world by planning for co-operation of the libraries on an international scale. The matters to be discussed demanded initiative and enthusiasm; this was no place for the academic formalities of a dead subject.

The vice-presidents of the Congress, who numbered 22 and represented 10 countries, were then presented to the president by Mr. W. R. LeFanu, the chairman of the Congress Committee, and each of them made a brief response. The British vice-presidents included Sir Zachary Cope (who drew attention to a valuable library not mentioned in the programme, that of the Medical Society of London); Professor E. C. Dodds, Harveian Librarian, Royal College of Physicians; Sir Francis Fraser, Director of the British Postgraduate Medical Federation; Mr. Geoffrey Keynes, Honorary Librarian of the Royal College of Surgeons; Mr. H. J. Seddon, Honorary Librarian of the Royal Society of Medicine; Dr. J. W. Trevan, of the Wellcome Research Institution; Dr. A. L. Goodall, Honorary Librarian of the Royal Faculty in Glasgow, and Mrs. Lilian Lindsay, Honorary Librarian of the British Dental Association.

Medical periodicals from 68 countries on display in the Old Library, B.M.A. House.

The Armed Forces Medical Library

An exhibition to illustrate the services of the Armed Forces Medical Library at Washington was opened later on the same day at the Wellcome Research Institution. The American Ambassador in London was expected to perform the ceremony, but in his unavoidable absence this was done by Colonel EISSLER, of the Embassy, who said that in America they were very proud of the Armed Forces Medical Library. The Library was founded in 1836 and was now the largest collection in the Western Hemisphere and among the five or six largest medical libraries in the world. It was in 1868 that John Shaw Billings became the librarian, and he raised it from a collection of 5,000 volumes until, in 1895 when he left it, the volumes numbered over 100,000, and the great *Index-Catalogue*, which Dr. William Welch, of Johns Hopkins, once called the most important contribution Americans had made to medicine, was begun. Colonel Eissler said that the Americans felt that the Library was held in trust for the advance of medical science and for the use of all men in every country at work on the problems of disease. He was told that the catalogue was valued in Great Britain. Fifty-seven volumes had been published since its inception in 1880, and copies were deposited in many libraries and research institutions throughout the world. The services and resources of the Library, subject only to limitations of time, money, and personnel, were available internationally.

The exhibition was in the form of large panels illustrating the achievements and services of the library, the latter including photo-duplication, reference, translation, and research.

The final session of the congress was held on July 25, with Mr. R. Eriksson (Karolinska Institutet, Sweden) in the chair. Papers on international co-operation were read by Mr. E. Carter (Unesco) and by Mrs. Eileen Cunningham (Vanderbilt University, Nashville, Tennessee). These were followed by a general discussion on the possibility of establishing an international medical library association. The following committee was appointed to ensure continuity of international co-operation among medical librarians and to prepare for a

second congress after a suitable interval: Dr. J. Anker (Denmark), Mr. W. J. Bishop (U.K.), Dr. S. A. Chitale (India), Mrs. E. R. Cunningham (U.S.A.), Mr. R. Eriksson (Sweden), Dr. A. Hahn (France), Professor K. J. Hartmann (Germany), Dr. A. H. M. C. Kessen (Netherlands), and Mr. W. R. LeFanu (U.K.). Lieutenant-Colonel F. B. Rogers (Armed Forces Medical Library, Washington) expressed the appreciation of the delegates for the excellent organization of the congress and the hospitality accorded them while in London. It was announced that 315 delegates had registered from 32 countries and three international organizations.

SOCIAL MEDICINE CONGRESS IN VIENNA

[FROM A SPECIAL CORRESPONDENT]

An international congress of social medicine* was held in Vienna from May 23 to 25 under the presidency of Professor P. VERGA, director of the Institutes of Pathology and Cancer Research, University of Naples. The congress was attended by about 200 doctors. The three main themes were "Health and Living Conditions," "Effects of War on Physical and Mental Health," and "Medical Measures in the Face of these Problems."

On the first theme, Professor J. GILLMAN (Physiology Department, Witwatersrand University) said that complexes of nutritional and endocrine variations, rather than single factors, might influence the incidence of certain diseases and account for some of the differences between populations. As the diet of a population changed from inadequate to adequate, some diseases, such as pellagra, tuberculosis, and certain liver diseases, might be expected to decrease, and others, including diabetes, cardiovascular disease, and some forms of cancer, to increase. In addition to climate and geography, man determined to some extent his own disease pattern through his increasing influence on the social and economic environment in which he lived. Dr. R. GIRARD (Guadeloupe) presented health statistics from the less developed parts of the French Union, and analysed the achievements and needs of their health services: for instance, the ratio of doctors to inhabitants was 1:30,000 in Afrique Noire; 1:10,000 in Madagascar; 1:5,000 in Algeria; 1:4,000 in Guadeloupe; and 1:1,100 in Metropolitan France.

In the general discussion Dr. ALICE STEWART, Reader in Social Medicine, University of Oxford, summarized the work of her team upon the spread of tuberculosis in factories: this suggested that the risk to a given population housed in large groups in spacious workrooms might be greater than when divided into small though overcrowded groups. Dr. P. D'ARCY HART, director of the Medical Research Council's Tuberculosis Research Unit, London, spoke on priorities in tuberculosis control and research. In countries with underdeveloped tuberculosis services, present chemotherapy had a much more limited use than in those with advanced technical resources and communications; prevention, particularly by improvements in living conditions, must continue to be the main weapon in control. Even in the more technically advanced countries the continued importance of social conditions in affecting tuberculosis levels should not be forgotten. Dr. Hart gave some examples of this continued relevance in Britain: in spite of sharp declines in tuberculosis rates, differences between better-off and poorer areas were still striking. Professor L. S. BOGOLEPOVA (Central Research Institute for Health Education, U.S.S.R. Ministry of Health) outlined current methods in her field. Much stress was laid on lectures to the public. Lecturers ranged from well-known physicians and medical scientists to final-year students, and the subjects from diet and practical hygiene to the history of medical discoveries and the lives of famous scientists. Similar lectures were given to convalescents and out-patients in hospitals. In addition to articles in the general press, a large volume of popular literature was produced. Organizational responsibility lay with local "houses of health education," headed by the Ministry of Health's health education department; the Central Research Institute was responsible for improving educational techniques and for providing training for lecturers.

*Congrès Mondial des Médecins pour L'Etude des Conditions Actuelles de Vie.

Effects of War

The opening paper on the second theme of the Congress was by Professor G. FRONTALI, director of the paediatric clinic, University of Rome, on "The Nutritional State of Children in Italy in the Post-war Period," as ascertained by a survey under the National Research Council. Social classes showed great differences in the quality and quantity of nutritional intake. In the higher classes the intake was close to the recommended figures, and was only slightly less in the peasant class. It was considerably lower in adequacy among the children of urban workers. There were also geographical differences, and it was remarkable that owing to poverty vitamin-C consumption was particularly deficient in the south (sufficient to produce haemorrhagic syndromes), even though this region contained the most important centres of production of citrus fruit.

The secretary of the Chinese Medical Association, Peking, Dr. SU CHING-KWAN, described national efforts to institute public health and education methods in China after a period of high rates of infectious diseases, high infant mortality, and malnutrition, exacerbated by long years of war. He described the "Patriotic Health Movement," which aimed at making the whole population actively interested in practical hygiene and living conditions, thus assisting the still very limited qualified personnel. Campaigns for the proper handling of food, for destruction of flies, mosquitoes, and vermin, and for raising the general standard of cleanliness had been highly encouraging. Drs. M. SHIOTSUKI, N. KUSANO, and S. YAMAMOTO (University of Tokyo) gave first-hand experience of the lesions caused by the atomic bomb explosions.

The main report on the third theme was given by Dr. B. WEILL-HALLÉ (Paris), who discussed the Hippocratic Oath and medical ethics in the world as it is. Apart from the meeting in 1949, which revised the 1929 Geneva Convention, a number of conferences had been held on this subject since the war. Among these was the meeting of l'Office International de Documentation de Médecine Militaire at Vichy in 1951, where the doctor's position in the face of the threat of bacteriological warfare was discussed. In 1950 the Medico-Juridical Commission of Monaco, discussing the relationship between the doctor and his country, attempted to differentiate the loyal duty which the citizen owes to his country from the obligations which his specific social function imposes on him. This Commission proposed an international convention for medical practice which, confirming the bans of the Geneva Convention, condemns the use of medicine for destructive purposes, and according to which the doctor retains the right to refuse his collaboration to acts contrary to his conscience. The speaker made a plea for doctors to examine their consciences when asked to undertake work other than the preservation of health and life.

Sir S. S. SOKHEY, of India, late deputy director of World Health Organization, urged that voluntary groups and associations should be set up to further the study of living conditions and health, particularly in countries whose public health services were not yet mature. This suggestion, as well as some of Dr. Weill-Hallé's proposals, was included in recommendations submitted to the closing plenary session of the Congress by its president. It was agreed that the improvements in health which could undoubtedly result from various improvements in living conditions were still inaccurately defined in all countries; that the second world war had brought to the fore new aspects of the consequences of war upon the health of populations; that doctors should again be reminded of their ethical obligations not only to their individual patients but to the community at large; and that to fulfil these obligations and promote health on a world basis, unimpeded exchange of ideas and therapeutic measures was required.

British Medical Association

ANNUAL MEETING, CARDIFF, 1953

SUMMARY OF PROCEEDINGS

THE SECTIONS

SECTION OF PREVENTIVE MEDICINE

Wednesday, July 15

The Health Visitor and the Family Doctor

With the president, Dr. J. GREENWOOD WILSON (Cardiff), in the chair, Dr. LLYWELYN ROBERTS (Sheffield) opened a discussion on the health visitor and the family doctor. After giving a short historical review, Dr. Roberts stressed the importance of social as well as medical therapeutics. He felt that the health visitor was the key worker who should co-ordinate all the social agencies. It was still not yet fully appreciated by all doctors that health visitors were highly qualified nurses who, in addition to State registration, had taken at least the first part of the C.M.B. and had also obtained the health visitor's certificate. Health visitors could possibly assist the family doctor with the care of the mother and child, with problem families, with some psychological problems, with domestic emergencies due to ill-health, with the care of the aged in their own homes, with the care of the disabled, and with the care of the mentally deficient and the mentally sick. In many of these situations the health visitor could act as liaison officer between the doctor and whichever statutory or voluntary agency might best be able to give assistance. Dr. Roberts thought that there were far too many home visitors, and that the health visitor, by reason of her specialized training and experience together with her confidential position in the family, might well act as the channel for the economic employment of all the social agencies in any particular case. In order to achieve these aims there must be the closest relationship between family doctors and health visitors in exactly the same way as between general practitioners and district nurses and midwives.

Dr. STANLEY THOMAS (London) spoke as a family doctor of thirty years' experience. Among the important advances in medicine he had seen in his time he now counted the rapidly increasing liaison between general practitioners and the preventive medicine services. He referred to the paramount importance of the assistance of nurses in modern practice and instanced particularly the help received from the district nurse and midwife. He felt that there was similarly an essential need for the assistance of health visitors in unravelling the social problems of patients, particularly in connexion with young mothers and infant feeding, tuberculosis, mental illness, convalescence, problems of the aged, and juvenile delinquency. Doctors must first be convinced of the status and value of health visitors, and it was most important they should realize that she was first and foremost a hospital-trained nurse. In his opinion the health visitor was the key to liaison between the family doctor and the preventive medicine services.

The Cardiff Scheme

Dr. D. A. WILLIAMS (Cardiff) gave the point of view of a consultant physician with close personal experience of working with specialist health visitors. The scheme had started in Cardiff by the allocation of a health visitor to help in the aftercare of diabetic patients who had been admitted to Llandough Hospital. Owing to its success the scheme was extended by the attachment of other health visitors for patients with gastric disorders and with asthma. The health visitor was the ideal type of social worker—being a nurse of the status of ward sister who was also a social worker and an ideal liaison officer. She had a particular part to play in providing sound health education in the home, where it was most needed and most likely to be heeded. The three diseases of diabetes, peptic ulceration, and asthma all provided home problems which were closely concerned with causation and treatment.

In the subsequent discussion Dr. H. D. CHALKE (London) described a modest scheme in his own area which had been successful in introducing individual health visitors to a number of general practitioners. He agreed that the health visitor should co-ordinate the work of other social workers, and he was particularly impressed by the part which the health visitor could play in the domiciliary care of old people.

Dr. M. L. H. EVANS (Lewisham) expressed the opinion that much antagonism could be broken down by regular meetings between general practitioner and health visitor. If the health visitor could come to such a meeting primed with details of problems presented by some of the doctor's cases, then her value would be likely to be more apparent. Dr. W. E. THOMAS (Glamorgan) spoke of the problems of county councils with large distances to cover. He thought liaison between doctors and health visitors had improved considerably. There was a national shortage of health visitors and it was difficult to make additions to the staff. Dr. MARY ESSLEMONT (Aberdeen), as a general practitioner with previous local authority experience, made a strong plea for direct contact between doctor and health visitor, preferably by telephone. Dr. W. B. QUISENBERRY (Hawaii) also spoke from a background of experience of both general practice and public health. He thought that health nurses were so versatile that doctors might be inclined to expect too much from them. They played an important part in the care of the chronic sick, and the speaker had found them of great value in his scheme for cancer control. In incipient mental illness they could do much good.

Dr. S. S. B. GILDER (World Health Organization, Geneva) thought that health education was the particular sphere of the public health nurse. More and more the importance of sociology in medicine was being recognized, and in certain circumstances, such as in a very backward area, a public health nurse might be able to achieve as much success as a medical officer.

Dr. A. TALBOT ROGERS (Bromley) said that a number of recent inquiries had all revealed a lack of understanding between general practitioners and health visitors. They must get together and realize their common problems. He was critical of too much specializing among health visitors. The all-purpose health visitor was the best person to assist the family doctor. The health visitor should work with the family doctor rather than for him, and he deprecated the argument often put forward that general practitioners were too busy to cope with social problems.

Dr. W. M. FORD-ROBERTSON (Beirut) wondered whether either the family doctor or the health nurse was adequately trained in the psychosomatic aspects of general practice.

CANCER AND THE COMMUNITY

The meeting of the Section continued in the afternoon with a discussion on cancer and the community. Dr. PERCY STOCKS (Rhos-on-Sea) was unable to be present, and his opening paper was read by the president, Dr. J. GREENWOOD WILSON (Cardiff). Dr. Stocks felt that the attitude of the general public to the cancer problem differed from that of the medical profession. The former looked towards prevention while doctors were at the moment more concerned with improvements in treatment. It was time to bring the cancer problem fairly and squarely into the field of preventive medicine. As measured by the estimated loss of working life, cancer deaths were now of greater economic importance than fatalities from respiratory tuberculosis or accidents. The finding of statistical relationships between cancer incidence and environmental factors ought to lead to action now, and not be shelved to await a full understanding of cancer aetiology—which may be long delayed. Researches arising out of such statistical evidence were already proving fruitful in cancer of the lung and stomach.

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Medical officers of health could give effective assistance in environmental field studies on these and other forms of cancer. For instance, why was cancer of the stomach commoner in certain large cities and in some rural areas of North Wales? The public should be informed of the statistical evidence implicating environmental factors such as smoking, so that each individual could decide for himself what it amounts to. The responsibility of the medical officer of health for health education should include cancer education.

A Programme for the Control of Cancer

Mr. RONALD W. RAVEN (London), in his opening remarks, pointed out the world-wide challenge of cancer. He gave details of recent national variations in growths of different sites, and dealt briefly with the family and individual problems that can arise as a result of cancer.

Mr. Raven then outlined a five-point programme for the control of cancer. (1) *Research into causation.* Clinicians and laboratory workers must co-operate, and more field research might yield important results. (2) *Prevention.* Cigarette-smoking and atmospheric pollution possibly had something to do with lung cancer, and here there was a place for preventive work, as there was in industry in connexion with carcinogenic mineral oils and tar. Surgery also had a place in the removal of pre-cancerous conditions. (3) *Early diagnosis and treatment.* Cancer is at first always a local disease, and the aim should be to diagnose it before spread has taken place. Progress has been made in treatment by surgery, radiotherapy, and chemotherapy. (4) *Rehabilitation and after-treatment.* There was a need for special convalescent homes for patients who had been treated for cancer. (5) *Care of patients with advanced disease.* This was a big problem at present. Much could be done to relieve pain, and above all else despondency must be averted.

Mr. Raven emphasized that the community had certain responsibilities in such a programme, chiefly in the direction of prevention and early diagnosis. The public must be advised how they can play their full part, and cancer education was therefore necessary. There should be an education plan on a national basis with the object of substituting intelligence and optimism in the place of ignorance and fear. To achieve this the speaker looked to medical officers of health, acting through local cancer education committees. The medical officer of health would be greatly assisted by his field workers, such as the district nurses, health visitors, and midwives. Medical students and student nurses should receive full education in early symptomatology. The methods of teaching would include leaflets, articles in the press, lectures, films, and the use of wireless and television. A very useful series of 12 leaflets had been produced by the Marie Curie Memorial Foundation which gave simple facts about cancer in general and essential information about cancer of certain special sites.

Dr. E. K. MACDONALD (Leicester) said that the size of the cancer problem could be stated in graphic terms by equating the number of sufferers in England and Wales at any one time to the total population of a town the size of Blackpool or Southend-on-Sea. The total number of new cases each year was equivalent to the population of a city like Oxford, while the total cancer deaths each year were equivalent to the complete wiping out of a town the size of Doncaster or Southport. Although some cases were asymptomatic until too far advanced for remedial treatment, and in others the rate of growth was too rapid, nevertheless it was true that many patients had symptoms present for a considerable time before medical advice was sought. It was to such patients that cancer education should be directed. It has been calculated that if all the cases were diagnosed and treated by the best known methods the chances of survival would be more than doubled.

It was the duty of the local health authorities under Section 28 of the National Health Service Act to carry out any type of health education that might better the health of the people. Something was being done towards cancer education in some areas, but this was not enough. In order to achieve success co-operation was necessary between the medical profession, the health department, and the public. Dr. Macdonald hoped that all those attending the meeting would return to their own areas and see if something more could not be done in the way of cancer education. The Central Council for Health Education would be delighted to help if asked.

Cancer Prevention in Hawaii

In the discussion, Dr. W. B. QUISENBERRY (Hawaii) gave an account of the cancer problem in his own country and how it was being tackled. He showed some interesting slides to emphasize the points he made. The problem in Hawaii had increased as the population had aged, and cancer was now the second commonest cause of death. The stomach was the commonest site of cancer, and there were interesting differences in incidence between the Japanese and Caucasian population. The policy of making every private physician a cancer-detection officer had been adopted. Their cancer education programme had been directed towards getting every citizen to have regular physical examinations, preferably every six months, as well as to report to his doctor any signs which might mean cancer. Pathological material could be sent in to a central laboratory without charge, and material from 11,647 patients had given 112 positive results, including 24 specimens taken from patients with uterine cancer who had been asymptomatic but who had been to a cancer-detection clinic. Dr. Quisenberry concluded that cancer prevention was a field which needed far more attention than it had yet received.

The PRESIDENT, in drawing the discussion to a close, said that at the moment there was a divided medical profession in this country on this point, and it was not easy for the medical officer of health to achieve any success with a cancer education programme unless he had the backing of the local doctors.

SECTION OF DISEASES OF THE CHEST

Friday, July 17

Artificial Pneumothorax in Pulmonary Tuberculosis

With the president, Sir CLEMENT PRICE THOMAS (London), in the chair, Dr. HOWARD NICHOLSON (London) opened the discussion. The continual changes in methods of treatment had made it difficult to assess the value of artificial pneumothorax in pulmonary tuberculosis. Nowadays it was necessary to gauge the effects of pneumothorax in conjunction with chemotherapy and to contrast the results with those of pulmonary resection. It was too early to reach definite conclusions. Nevertheless, the conditions in which it was safe to start pneumothorax were well known. It should not be considered in cases with acute spread or pneumonic consolidation, or when there was active bronchial tuberculosis of the lobar or segmental bronchi. Pneumothorax therapy was still indicated when cavities persisted after streptomycin treatment, when there were scattered foci of infection, and when the disease was progressive in spite of adequate conservative treatment. Pneumothorax had no place in treating disease of the nodular type or tuberculomata.

Dr. C. H. C. TOUSSAINT (London) considered that it was now time to review the value of artificial pneumothorax in the light of the widespread use of antibiotics. It was salutary to recall the time-honoured view that artificial pneumothorax should always be an adjunct to general treatment. Since the advent of antibiotics he had remodelled his opinions on the manner in which artificial pneumothorax should be used. It was best to secure cavity closure before inducing a pneumothorax, which could then be safely used as a method of treatment during the patient's rehabilitation. When used in this way it was not necessary to maintain artificial pneumothorax for prolonged periods.

Mr. R. S. BARCLAY (Newton Mearns, Renfrewshire) thought that pneumothorax would be less used in the future as a method of treatment. Serious complications had always been a drawback to pneumothorax therapy, but results of treatment were often so good that its efficacy should not be underrated. Most complications could be avoided by simultaneous antibiotic treatment. The aims of pneumothorax treatment were relaxation of the lung and cavity closure. Endobronchial disease was a contraindication and should diligently be sought by bronchoscopy and bronchography. Preliminary rest and antibiotics should always be used so that progress could be assessed and future treatment planned. There should be no hesitation in abandoning an ineffective pneumothorax. The alternative treatment by combining antibiotics and surgical resection should always be considered as the best method of getting the patient back to health as quickly as possible.

Dr. C. S. DARKE (Sheffield) said that pneumothorax treatment should aim at restoring full health while incurring least risk of impairing respiratory function. The optimal period for maintaining a pneumothorax was not known. Some physicians had thought that three years was sufficient, whereas others had maintained treatment almost indefinitely. There was always a risk of disabling and dangerous complications developing while a pneumothorax was present. The policy should be to terminate the pneumothorax deliberately as soon as the disease was arrested. The length of time could be greatly reduced by using chemotherapy and postural retension. A pneumothorax which had given adequate pulmonary relaxation could often be abandoned safely after eighteen months or two years.

Dr. PETER W. EDWARDS (Cheshire Joint Sanatorium) thought that one drawback to prolonged early treatment was that it might prejudice the subsequent induction of a pneumothorax. In one series of patients it had been impossible to induce a pneumothorax in one-quarter of the cases after a period of bed rest. Although rest was essential it should be combined with an early pneumothorax when this was indicated. There was also a danger in embarking too hastily on a course of antibiotic treatment. During the initial rest period pneumothorax could safely be started as soon as the temperature and sedimentation rate began to fall. The correct period for maintaining a pneumothorax was about three years. In cases observed for a period of ten years it had been shown that phrenic crush treatment was of great value when combined with pneumothorax, or used alone when pneumothorax induction had proved impossible.

In the discussion which followed, Dr. V. COTTON-CORNWALL (Liverpool) thought that it was too early to decide whether a shortened period of pneumothorax treatment was of lasting benefit to the patient. In reply to Dr. W. S. HAINES (Mombasa), Dr. TOUSSAINT said it was not always necessary to do thoracoscopy in all pneumothorax patients, but Dr. EDWARDS preferred to do routine thoracoscopy.

Constrictive Pericarditis

Professor FREDERICK R. G. HEAF (Cardiff) took the chair when three short papers were read. Mr. O. S. TUBBS (London) gave an account of constrictive pericarditis. In this disease the heart became encased in a thick inelastic fibrous coat which prevented it from expanding and contracting properly. Calcification of the pericardium commonly occurred, but was not an essential feature. Almost all cases had a tuberculous origin. The clinical picture was that of congestive heart failure in the absence of any readily demonstrable cause. Although peripheral venous congestion predominated, breathlessness from pulmonary congestion was often present. The heart remained small, the apex beat did not shift on changing posture, and cardiac irregularities were common. Radiography showed diminished cardiac pulsation and sometimes pericardial calcification. Excision of the pericardium was required when symptoms persisted after simple treatment. A coloured film was shown to demonstrate the appearances of the heart at operation.

Congenital Atresia of the Oesophagus

Mr. R. H. FRANKLIN (London) said that atresia of the oesophagus, although a rare congenital abnormality, was about as common as hare-lip. Five anatomical varieties had been described, but only two were common. Early diagnosis was not difficult if the possibility of the disease was remembered. Affected babies went blue soon after birth and the blueness returned after pharyngeal suction. Diagnosis could be confirmed by passing a soft rubber catheter to the point of obstruction. Radiographical confirmation could be obtained by introducing 0.5 ml. of iodized oil through the catheter. This should only be done under direct observation when the possibility of surgical treatment had been considered. Radical surgical repair gave most satisfactory results.

Radiological Diagnosis of Pneumoconiosis

Dr. ARCHIBALD L. COCHRANE (Cardiff) described a method of analysing the radiological changes in pneumoconiosis. This system had formed the basis of an international classification. Pneumoconiosis was described as "simple" when the radiological shadows were diffuse and as "complicated" when massive fibrosis was seen. Both forms were divided into four grades according to severity. The figures 1 to 4 denoted the severity in the simple form, and the letters A to D in the complicated form. Standard films representing the minimal changes in each category were available. The respiratory disability and the prognosis could be accurately predicted from the radiological appearances alone.

Mr. E. F. CHIN (Southampton), Mr. J. H. PIERRE (Trinidad), and Dr. A. CAPLAN (Penarth, Glam) took part in the discussion which followed these papers.

SECTION OF NEUROLOGY

Friday, July 17

Diagnosis and Treatment of Meningitis

With the president, Dr. W. RITCHIE RUSSELL (Oxford), in the chair, four papers were read. Dr. HONOR M. V. SMITH (Oxford) pointed out that since modern therapy had provided potent remedies, often specific for certain organisms, the need for early and accurate differential diagnosis in meningitis had become urgent. She emphasized that the early institution of appropriate chemotherapy, with access of the remedy in adequate concentration to all sites of infection, was essential. Recognition of the causal organism was necessary, and it was largely early recognition and treatment that had reduced mortality, which remained high despite specific remedies whenever the start of treatment was delayed. The sulphonamides were effective in meningococcal infection, but pneumococcal meningitis, a most fulminating disease, required penicillin by intramuscular and intrathecal injections: the latter route was safe in a dosage of 10,000 to 20,000 units for adults. Streptomycin gave good results with influenzal and coliform organisms and was essential, with or without isoniazid, for tuberculous meningitis. The onset of this disease was insidious, and the family doctor should consider this diagnosis whenever unexplained malaise, irritability, headache, and fever persisted for five to six days in a child or young adult. Dr. Smith outlined a scheme for reducing delay in the start of treatment—urgent admission to hospital of any patient with suspected meningitis, with a preliminary covering dose of sulphonamides and penicillin, and intramuscular injection of barbiturates to guard against epilepsy (a common hazard in purulent meningitis, especially in children, when it had a very adverse effect on prognosis).

Dr. W. HENDERSON (York) raised the problem of recurrent pneumococcal meningitis. Dr. C. PALLIS (Cardiff) asked if preliminary penicillin might not obscure the results of examining the C.S.F. for organisms. Dr. MARGARET EGAN (Manchester) suggested that isoniazid might also have a

special place in tuberculous meningitis. Mr. MURRAY A. FALCONER (London) asked for the incidence of deafness with streptomycin treatment, which Dr. SMITH said was 10%.

Dangers of Bulbar Poliomyelitis

Dr. A. B. KINNIER WILSON (Oxford) said that this form of poliomyelitis was responsible for the great majority of deaths. Severe involvement of respiratory or vasomotor centres was a rare direct cause of death. More commonly defects in swallowing caused inhalation of saliva or food; or respiratory failure came from concomitant involvement of bulbar centres and respiratory muscles. A clear airway was an urgent need, and simple tilting of the patient in the prone position would usually secure this, though additional suction was at times required. Defects of swallowing were often gradual, and vomiting was not usually thought of as due to bulbar irritation. Nevertheless early recognition was important, because with slow seepage of secretions into the lungs and consequent reduced aeration—not of themselves dramatic—a sudden choking attack might be fatal. A stethoscope over the larynx might detect early swallowing difficulty, and a throat microphone which could be left in position and recorded sounds into a loudspeaker allowed respiratory or swallowing defects to be heard at once throughout the ward. The speaker criticized the widespread use of tracheotomy with controlled respiration via an anaesthetic bag, as used in the recent Copenhagen epidemic. It was unnecessary unless respiratory muscles were also involved. It deprived a very ill patient of the comfort of speech, and later closure of the tracheotomy might be difficult. Dr. Kinnier Wilson concluded by demonstrating on himself the sound of normal breathing and swallowing with a throat microphone.

Dr. W. W. MAPLESON, a physicist from the anaesthetic department at Cardiff, described a two-way valve for use with the Oxford inflator, electrically driven, in place of manual inflation. Dr. A. FULLERTON (Batley) was told in reply to a question that recent tonsillectomy seemed to increase the incidence of the bulbar form of poliomyelitis, but it was not clear that the overall incidence of the disease was thus increased.

Surgical Treatment of Intracranial Haemorrhage

Mr. RICHARD T. JOHNSON (Manchester) said that cerebral haemorrhage in generalized arterial disease had as yet no surgical treatment. This had a growing place, however, in leakage from an aneurysm or angioma, which might present as a space-occupying lesion from slow bleeding with clot formation, or more commonly as frank subarachnoid haemorrhage. In investigating the latter, he thought angiography was always desirable, but might be dangerous in unskilled hands. When to transfer an ill patient to a special centre was a problem. Soon after the haemorrhage angiography might worsen the condition and arterial spasm obscure an aneurysm. Patients seen later were better surgical risks because they were selected. However, Mr. Johnson said that when he did see the patients early he used angiography in the hope of defining the problem for later surgery. Treatment of a clot by evacuation was often very successful, though gradual evacuation might be needed if intracranial tension was high in order to avoid reactionary bleeding at the edges of the cavity. For an angioma full excision was best, if possible; clipping of vessels feeding it had been disappointing. Aneurysms could sometimes be approached directly, and hypotensive drugs had been a definite help. Clear angiographic demonstration was essential, and temporary occlusion of the opposite carotid allowed better concentration of the contrast medium. If direct approach was not practicable there was no doubt of the value of carotid ligation. Steady progress was being made in this field of surgery, and figures from the Manchester department of neurosurgery for the last 18 months supported this.

Dr. T. ROWLAND HILL (London) pleaded for a more experimental approach in the apparently hopeless case, and asked what the exact cause of death was. He felt carotid ligation as an emergency measure even without neurosurgical help was justified at times.

New Trends in the Diagnosis of Spastic Paraplegia

Mr. MURRAY A. FALCONER (London) mentioned the frequency with which intervertebral disk degeneration caused pressure on nerve roots or cord. The mechanism could be by herniation of the disk backwards, by rupture of the annulus fibrosus with extrusion of a part of the nucleus, or by atrophy of the whole disk with secondary changes in vertebrae such as the formation of osteophytes or spurs. The second mechanism produced a picture of spinal block, with manometric changes and raised C.S.F. protein. Myelograms aided the diagnosis, and surgical removal of the soft-tissue protrusion was best. The third mechanism caused a very slowly progressive paraplegia, and straight radiographs as well as myelograms were helpful in diagnosis. Treatment was first by immobilization, but if operation was needed it was best to do a laminectomy and cut the dentate ligament to free the cord from pressure against the bony ridges present. Attempts at removing these had caused further cord damage. This syndrome was common in the cervical region, though it could occur also in the dorsal spine, and the picture of "cervical spondylosis" was becoming more frequently recognized. The neurological signs were patchy, rather than giving a picture of a transverse cord lesion, and the detailed pathology of the condition was still a matter of argument. However, intermittent trauma, in which traction played a part, was certain, and the speaker thought that compression of the anterior spinal artery might also be concerned in the aetiology.

Dr. J. D. SPILLANE (Cardiff) suggested that correlation of the *x*-ray changes with the presence or absence of signs and symptoms was required. Both he and Professor P. C. P. CLOAKE (Birmingham), who emphasized the value of immobilization in a collar, suggested that pressure arising in the way described was the commonest cause of insidious paraplegia in the elderly—a view with which the chairman agreed.

SECTION OF OCCUPATIONAL HEALTH

Friday, July 17

Symposium on Work and Age

With the president, Dr. J. A. L. VAUGHAN JONES (Leeds), in the chair, Dr. W. P. D. LOGAN (London) introduced a symposium on work and age. He described how over the past 80 years or so birth rates and death rates had been falling in this country, thereby materially changing the age distribution of the population. At present there were two people of working age (15 to 64 years) for every one person outside this age range, whether younger or older. This ratio was now higher than it had ever been, but it would decline still further during the next few decades. This meant that a relatively greater number of children and old people would become dependent on a decreasing population of people of working age. At the same time the proportion of old people in the population would continue to increase and by 1991 would be almost as great as the proportion of children.

Age of Retirement

The 1% sample results of the 1951 census had provided some up-to-date information about the numbers of elderly people who were retired or still working. At ages 60 to 64 years 10% of men were retired, but by the age of 70 years this figure had increased to 70%. Employers, managers, and men working on their own account carried on working to a higher age than the largest group—namely, those classified as operatives. The nature of the occupation also had an influence on the time of retirement. Whereas among agricultural workers aged 70 years and over only 59% were retired, the corresponding figures for

rail transport workers and fishermen were 96 and 94% respectively. The figure for miners and quarrymen was 92%, and for all men aged 70 years and over 77%.

The survey of sickness carried out by the Central Office of Information had shown that in an average month of 1950 days of incapacity for work per month averaged 0.69 per man aged 16 to 34 years, and increased steadily to 1.61 at ages 55 to 64 years, after which no further increase was recorded. The significant inference is that time lost on account of sickness does not suddenly rise steeply at a certain age (for example, the present arbitrary age of retirement, 65 years), but probably increases gradually throughout at least the latter half of adult life. Dr. Logan said that in his opinion there was no justification for retiring people at a specified age. Elderly people, however, must be relieved of work load, and efforts to this end should often be applied under the age of 60 years and not deferred until evidence of breakdown occurred.

Sickness in Post Office Workers

Dr. D. D. REID (London) amplified this aspect of the problem. He based his remarks on an intensive epidemiological survey of sickness, retirement on account of invalidity, and premature deaths which had been carried out over a period of four years among the staff of the General Post Office—one of the largest employers of labour in Great Britain. Sickness absence rates among young women were as a rule worse than those of the equivalent group of male workers. However, the rates among women in their fifties compared favourably with those of men of the same age. While older men were less often absent than young male staff, the average duration of absence and the total number of days lost per person were greater. To some extent these differences were attributable to differing patterns of sickness in the separate age groups. Whereas the common cold—a disease of short duration—was frequent in the younger age groups, chronic bronchitis—a cause of prolonged and recurring sickness absence—chiefly affected men over the age of 45 years. Premature "invaliding out" was mainly occasioned by chronic bronchitis, degenerative heart disease and atherosclerosis, and arthritis and rheumatism—all disorders which adversely affect physical rather than mental capacity for work. Outdoor staff were more often and more seriously affected than indoor staff. Dr. Reid concluded that the urgent need was for job modification to lighten the physical load on the older workers.

The Elderly Skilled Worker

Against this background the Rev. A. T. WELFORD (Cambridge), speaking as a research psychologist, summarized the work which he and his colleagues at Cambridge had been conducting into some fundamental problems in this field. The aim of research into this problem in industry should be to find ways of avoiding the drift of older people into light unskilled jobs. So far as possible they should be assisted to continue in the work in which they were skilled, without according them any special consideration. Towards this end the most promising approach seemed to lie in the modification of the demands made by the sort of work which had been shown to be unfavourable to older people. This could be done by improving machines and work design. Recent investigations, both in the laboratory and in industry, had suggested a number of ways in which such adjustments might be made. It had been established that with increase of age the average level of performance or activity tended to fall and the scatter round that average tended to increase.

However successful the policy of adapting work to the capacity of older people might be, there would nevertheless always be some who would have to change their jobs in middle age. This involved the training of older people, a problem about which adequate knowledge and experience are yet lacking. Current research seemed to show that difficulty in acquiring a new skill might often lie in the actual training rather than in the learning process. Finally he advocated an aggressive attitude by industrial medical officers to influence the design of machine tools and in securing better and more timely training of ageing workmen.

In the final paper Dr. I. M. RICHARDSON (Aberdeen) gave an account of an investigation which he had made into the effects of ageing on working capacity among foundry workers and coal-miners. If the problems of age and work were to be solved it was necessary first to study individuals, then from those studies to formulate the appropriate average policy, and, thirdly, to go back to the individual and decide how best to apply that policy to him. In his experience the average age at which demands for relief from heavy work occurred was somewhere in the middle fifties. He acknowledged that the term light work had been adversely criticized, but he felt it must be retained because it had a definite meaning to the worker. What was really important was not the title but the meaning. For the workman, light, or more accurately lighter, work meant work in which the pace was slower and in particular was under the individual's own control. Whenever feasible this need should be met without a change of job. When this was not practicable the alternative job should permit the opportunity for the exercise of existing skills.

A lively discussion followed, and all the speakers commended the quality of the papers and stressed the vital importance of the subject. Dr. H. R. FREDERICK (Port Talbot) spoke about the problem as it affected South Wales, particularly the tinplate workers. Dr. G. J. ROBERTS (Cardiff) wondered whether the desire of the skilled workman for a change of job represented opposition to modern mass-production methods, including breakdown of jobs and processes. Dr. W. B. QUISENBERRY (Hawaii) raised the question of accident proneness in older workers and the place of sheltered workshops for their employment. Professor R. C. BROWNE (Newcastle-upon-Tyne) asserted that it was the duty of medical teachers constantly to convince their pupils that the prescription of work should be as precise and detailed as the prescription of medicaments. Dr. J. MCG. ROGAN (London) made the important point that the workman himself often realized his diminishing powers and solved his own problem by finding suitable alternative work. This signified that those concerned in this problem should beware of being too "grandmotherly" in their efforts on behalf of every workman.

Occupational Cancer

Dr. J. GWYNNE MORGAN (Clydach) contributed an occasional paper on a series of cases of occupational cancer of the nose (44 cases) and cancer of the lung (110 cases). These had been observed over the last 40 years among workmen engaged in nickel refining. Some of the processes were very dusty and some of the materials contained arsenic as an impurity. Intensive efforts had been made through mechanization, reduction of dustiness, and the use of arsenic-free sulphuric acid to control the hazard. While sporadic cases continued to appear, none has so far occurred among men who had commenced work on the plant during the past 25 years. A noteworthy feature was that not infrequently the disease had not become manifest until several years after the workman has ceased work in the processes.

Dr. Morgan also described and demonstrated a simple test for detecting coproporphyrin in the urine of lead workers.

SECTION OF OPHTHALMOLOGY

Friday, July 17

Ocular Complications of Diabetes

With the president, Mr. J. H. DOGGART (London), in the chair, papers on the ocular complications of diabetes were read by Mr. G. I. SCOTT (Edinburgh) and Dr. LEONARD H. HOWELLS (Cardiff). Mr. SCOTT emphasized that there was now no doubt that diabetic retinopathy was an entity quite distinct from that occurring as a result of hypertension or atherosclerosis. Even in the older patients in his

series of 150 diabetics retinopathy was equally common in patients with or without hypertension. He also noted that the incidence of retinopathy increased very markedly with the duration of the diabetes, although he stated that some 10% of cases showed retinopathy within a year of the condition being diagnosed. In diabetics of twenty years' standing or more the incidence was over 70%. The speaker then described recent pathological work and findings in the retina, and gave a classification of the clinical stages. In the first stage capillary micro-aneurysms were a prominent feature. These were followed first by punctate and later by blot haemorrhages. Subsequently either retinal haemorrhages might progress and exudates develop or there might be haemorrhages into the vitreous followed by retinitis proliferans, proceeding to detachment of the retina and degeneration of the eye. In another smaller group of cases the initial fundus changes consisted in retinal periphlebitis, following which vitreous haemorrhages and retinitis proliferans also occurred. The total incidence of retinitis proliferans in all cases of diabetic retinopathy varied between 9 and 16%. There was some evidence to suggest in Mr. Scott's cases that careful control of the diabetes reduced the incidence of retinopathy, probably through an effect on capillary fragility. He had found rutin to be of no value. Other changes briefly discussed were alterations in the refraction of the eyes, the development of true diabetic cataract in young persons, and the effect of diabetes on the incidence and development of senile cataract.

Dr. HOWELLS began by saying that diabetes was becoming more common and that in this country some 3% of the population suffered from the disease. He stated that there was an undoubted hereditary transmission, and that treatment of the disease, in that it not only increased fertility but made childbirth safer, was bound to lead to increased numbers of surviving patients suffering from the disease. The disease was much commoner in overweight patients, at any rate in the older age groups. With the increasing longevity of diabetics due to modern therapy ocular complications became more common, and some 30% of all diabetics eventually developed retinopathy. He agreed that the incidence was 70% or more in old age, and had observed that in many of the older patients hypertension and renal changes were added to the ocular complications. In treatment he considered it essential in the older overweight patients to reduce weight, preferably by dieting. If this were successful the condition could be adequately controlled clinically without insulin in many patients. It was preferable to reduce weight by diet only, but if this were unsuccessful then there should be no hesitation in using dextro-amphetamine sulphate. In younger patients a diet should be prescribed which would enable them first to regain and then to maintain the standard weight for the patient's age. In a smaller series of patients than that analysed by Mr. Scott he found the incidence of retinopathy varied little according to the duration of the disease, and that it occurred at least as frequently in well-controlled as in partially controlled diabetes.

Mr. A. B. NUTT (Sheffield) considered the problems of cataract operation in diabetes. In his view, the eyes in these patients should not be considered normal and were more liable to complications; convalescence was often stormy. Among the complications he described were delayed wound healing, infection, haemorrhage, and post-operative iridocyclitis.

In the general discussion Dr. HOWELLS stated in reply to Mr. T. S.-B. KELLY (Hereford) that the renal threshold in diabetes was probably higher than is generally realized, and in reply to Mr. J. E. M. AYOUB (London) that although much work had been done there was no knowledge of any other metabolic factor which might be responsible for retinopathy. In reply to Dr. T. A. S. BOYD (Oxford) he said that at present no clinical differentiation in man should be made between diabetes resulting from insulin deficiency and pituitary dysfunction. Mr. NUTT, in reply to Dr. G. J. ROMANES (East Grinstead) said that the use of the methonium compounds during operation, with the idea of controlling haemorrhage, was probably dangerous in these cases, but suggested that toluidine blue might prove to be of value.

The President of the Association, Mr. J. W. TUDOR THOMAS, attended some part of the meeting, and welcomed members of the Section.

Corneal Grafting

In the second discussion on the scope of corneal grafting, with one of the vice-presidents, Mr. RUPERT J. PARRY (Cardiff) in the chair, the openers were Mr. B. W. RYCROFT (London) and Mr. E. C. ZORAB (Southampton). After a brief historical review of the past 150 years Mr. RYCROFT spoke about the factors which at present influenced the expansion of corneal-graft surgery. Under the heading of "Technique" he considered the fixation of the graft, the type of section, and the problem of total transplantation of the cornea. He also entered briefly into the problems of administration, touching on eye banks, the preservation of graft material, and the training of surgical teams engaged in this type of work.

The major problems of corneal-graft surgery at the present time were in oedema and neovascularization of the cornea, both of which were possible results of an antibody-antigen reaction the precise nature of which was still not determined in spite of much experimental work. In the speaker's view this reaction was the most important problem in corneal-graft surgery to be elucidated.

Mr. ZORAB dealt with the difficulties met with by the surgeon who was relatively inexperienced in this type of work, emphasizing that he must be eclectic in his decisions on choice of case, on when to operate, and that he should start with lamellar grafts in difficult cases. Technical accuracy in this work was extremely important. He made a plea for research into methods of accurate measurement of the corneal thickness, and into the possibility of developing a satisfactory mechanical trephine. He also discussed from his own experience the pitfalls and poor results occurring from errors of technique.

Mr. J. AYOUB (London) also discussed various complications which may follow the operation, particularly prolapse of the graft, post-operative glaucoma, the development of anterior synechiae, and the occurrence of oedema and vascularization of the grafts. He thought that some post-operative complications were probably due to allergy.

Mr. A. G. LEIGH (London) analysed the various factors resulting in post-operative opacification of the graft, dividing these into three groups: incorrect choice of case, faulty operative technique and post-operative treatment, and delayed opacification of the graft due to the formation of fibrous tissue on its posterior surface resulting from causes so far unknown.

In the general discussion, in reply to Mr. A. G. PALIN (Bristol), Mr. RYCROFT stated that he could offer no explanation for the clearing of the cornea which took place in some cases after a delimiting keratotomy.

SECTION OF ORTHOPAEDICS

Friday, July 17

The Injured Hand

With the president, Mr. A. O. PARKER (Cardiff), in the chair, Mr. W. GISSANE (Birmingham) opened a symposium on the injured hand, later acclaimed by several experienced orthopaedic surgeons as the best they had heard at any scientific meeting. Mr. Gissane spoke on major wounds of the hand. He emphasized the need for the expert planning of treatment; in dealing with manual workers, ultimate function was more important than appearance. The doctrine of saving all viable tissues might be dangerous when applied to the hand, because it so often led to the retention of a stiff, painful, and useless portion of that organ and to unnecessary delay in recovery. All workers showed a remarkable ability to make good use of remnants of a hand that

were painless, mobile, and strong. The aim of surgery must be to restore some of the fundamental uses of the human hand. These were: (1) To act as the two sensitive antennae of the body; thus retention of any part of the hand with normal sensation was important. (2) For use as a clamp to hold things down; the retention of the base of the hand alone would suffice for this. (3) To exert a pincer grip; for this function were required a thumb, its remnants, or a surgical replacement, and at least one finger or its remnants; at least one arm of the pincer must be mobile. (4) To serve as a hook to hold and carry; even the little finger would fulfil this purpose. (5) Finally the hand was a vice; for this purpose at least two fingers and the powerful clamping action of an intact thumb were required.

The intact skin of the hand was always covered with a wide variety of pathogenic bacteria. All hand wounds, therefore, were contaminated from the start, and the important factor in preventing infection was the circulatory response within the first few hours of wounding. This emphasized not only the urgency of surgical intervention but also its primary objective—to improve the blood supply to the injured area. Wound cleaning must be gently and thoroughly performed with a non-irritating soap or detergent, and under anaesthesia. Tension must be scrupulously avoided, and the wounded areas covered by some form of skin graft if tension-free suture was impossible. Judged against the likelihood of full restoration of function some common closed injuries of the hand came into the category of major injuries. Bennett's fracture-dislocation of the thumb and some dislocations of the interphalangeal joints of the fingers were best treated by open reduction and suture of the detached capsule.

Mr. R. J. FURLONG (London) confined himself to the problem of the cut flexor tendon. Immediate suture of the tendon was desirable because it kept the tendon in its normal place, which might otherwise become blocked by scar tissue, and because it tended to prevent secondary changes in the muscle and tendon proximal to the division. But primary suture might be undesirable because of contamination or destruction of the skin and other tissues; in that case skin closure alone was indicated, followed by early mobilization of the finger and hand. Secondary procedures such as tendon grafting were apt to fail if the surgeon was inexperienced and particularly if he had the wrong instruments. Primary suture of the profundus tendon distal to the proximal interphalangeal joint might often produce a useful finger, even if the result was a tenodesis. In the no-man's-land between the first interphalangeal joint and the distal palmar crease, primary suture might sometimes succeed if the sublimis tendon were sacrificed, but for injuries here grafting was usually necessary, of course as a secondary procedure. He preferred the palmaris longus with its paratenon for the graft. Judging the length of graft, position for suture, and tension to be exerted were all problems which should be solved by art and experience rather than set rules. The degree of flexion was determined by the position of the resting hand and fingers. The actual method of suture was no longer regarded as important: either silk or stainless-steel wire was a suitable material, although he preferred the latter. It was his practice to close the wound and apply a pressure bandage before removing the tourniquet.

Mr. EMLYN LEWIS (Cardiff) dealt with the problems of skin loss in hand injuries. In the case of some small defects local grafts from the hand itself could be used: sometimes a severely damaged finger could be filleted and used as a flap. When there was wide "degloving," the skin was seldom viable and paring back was better than attempts at primary suture. A free skin graft provided the most useful cover: the full-thickness graft was ideal but technically difficult to use. The split-skin graft was not suitable for direct application to exposed bone or tendon, and in the hand a further drawback was that it did not replace the palmar cushion. Direct flaps could be obtained from the forearm, and the disadvantage of putting both arms out of action could be obviated by suitable positioning. The amount of skin available on the forearm was limited, so that for larger defects he preferred to place the injured hand below the opposite acromion-clavicular joint and take the flap from that site. Abdominal flaps were inclined to be bulky, although they could of course be reduced later. Tube-pedicles provided good skin with an ensured blood supply, but could be used only in the treatment of the late case.

Mr. L. W. PLEWES (Luton) showed a colour film illustrating some of the methods of industrial rehabilitation of the injured hand. Recovery might be delayed by oedema and resulting fibrosis, by a persistent low hand temperature due to post-infective conditions or vasomotor disturbances, and by failure to use the hand at a very early stage for its usual functions. Another, and subtler, complication was extensor spasm, and Mr. Plewes had been able to demonstrate this by means of a specially constructed oscillograph.

Mr. R. G. PULVERTAFT (Derby) introduced the "chirodemons" of the Derbyshire hills in a series of amusing but highly instructive cartoons illustrating the pitfalls and mistakes of hand surgery. He agreed with Mr. Furlong on the importance of using the proper instruments, and said that watchmakers' tools were very suitable. It was his practice to remove the tourniquet before closing the wound, and he had found that bleeding ceased automatically after a few minutes; ligatures were seldom required. Mr. A. L. EYRE-BROOK (Bristol) considered that the tendon slings in the fingers could be divided and would heal when the soft tissues were sutured. He disliked suture of the tendon graft near the distal interphalangeal joint, and preferred to pass it through a tunnel in the phalanx. He had met with necrosis of the graft and later snapping as a complication. Mr. F. C. DURBIN (Exeter) discussed the disadvantages of plaster in the treatment of phalangeal fractures. For some time he had used open reduction and medullary fixation with Kirschner wires. The wires were buried, and were removed after six to eight weeks when body union had occurred. Severe comminution and gross infection were contraindications. Mr. E. MERVYN EVANS (Swansea) made a plea for the wider dissemination of surgeons and facilities for the treatment of hand injuries and indeed of all accidents. It was obvious from the symposium that important surgical decisions had to be taken at the outset of treatment in these injuries, and it was still too often the case that these decisions were being left to house-officers. Mr. R. H. C. ROBINS (Exeter) showed that the post-auricular skin would provide very satisfactory grafts for partly amputated finger-tips. Mr. I. LAWSON DICK (Edinburgh) questioned whether it was always necessary to incise the palm along the skin creases, and asked whether pollicization was such a valuable operation as had been suggested elsewhere. In reply Mr. PULVERTAFT agreed that crease incisions were not essential, but they did provide an invisible scar. Mr. EMLYN LEWIS supported the operation of pollicization, and enlarged on the use of the index finger for this purpose in the treatment of congenital deformities.

SECTION OF OTO-RHINO-LARYNGOLOGY

Friday, July 17

Management of Otitis Media

With the president, Mr. R. D. OWEN (Cardiff), in the chair, Mr. I. SIMSON HALL (Edinburgh) opened a discussion on the treatment of otitis media. By means of a chart compiled from the records of cases of acute otitis seen at Edinburgh before and after the introduction of sulphonamides and antibiotics, he showed that the operation for acute mastoiditis had almost disappeared. In his experience the sulphonamides were more effective on their introduction than they now were, so that nowadays they were only rarely used. The explanation probably was that resistance

to these drugs was increasing. On the other hand, the number of cases of chronic otitis coming for treatment was increasing, and certainly many more operations for chronic suppurative otitis media were performed at present than in the pre-sulphonamide era.

In the treatment of acute infections the choice of antibiotic depended on the results of bacteriological tests, but as a rule penicillin should be used first, even when no organisms were available for examination. It was much cheaper than the newer drugs, quite as effective in most infections, and rarely gave rise to side-effects. After three days it would be apparent if penicillin was adequate as the sole means of treatment. If not, then in the absence of otorrhoea pus should be aspirated from the middle ear by puncture or myringotomy in order to test for sensitivity. Mr. Simson Hall's next preference was for streptomycin, but the possible damage this might cause to the hearing had to be remembered. When a slight residual discharge was present at the end of treatment of the acute condition, he had found antibiotic drugs of no value. Any apparent improvement was due to the scrupulous cleansing of the ear which was a necessary accompaniment to their use.

Mr. J. I. MUNRO BLACK (Newcastle-upon-Tyne) said that in examining the ear he advised the use of a headlamp and frontal mirror rather than an electric auriscope. The differential diagnosis lay between otitis media, external otitis and boils, mumps, tonsillitis, toothache, or foreign body. Fortunately treatment for otitis media would also cure boils and tonsillitis, so in these conditions a mistake in diagnosis did no harm. The only advantage of the sulphonamides over penicillin was ease of administration, but against this they were less certain in action and might produce side-effects which mimicked complications of otitis. The combined use of the sulphonamides and penicillin should be avoided. The newer antibiotics could be tried if the organisms proved resistant to penicillin. Treatment should be continued till the otitis was better, as shown by cessation of discharge and return of the tympanic membrane to normal.

Failure to maintain improvement might be due to resistant organisms or to some aggravating factor—e.g., enlarged adenoids, sinusitis, or chronic otitis. If the condition worsened or complications developed all treatment should be stopped for 24 hours and the position reassessed. Surgical intervention was now very rarely needed. The decision to operate was determined by the presence of pus or necrotic material which was not absorbing. The prognosis in treated cases was good, most patients being now successfully treated by the general practitioner.

Mr. GEOFFREY H. BATEMAN (London) agreed with the previous speakers that the change in treatment was quite revolutionary. Now the general practitioner had remedies which he could apply with greater advantage in the early stages, he was making an earlier diagnosis with the aid of an electric auriscope. Sulphonamides occasionally masked an infection, but they enabled cases to be watched confidently, and any operation that might be needed could be postponed to the most favourable time, so that post-operative septicaemia had practically disappeared. Penicillin and the other antibiotics had taken us a step further in effective control. But surgery was sometimes necessary, even when the organism was sensitive and the dosage adequate. Because pain disappeared and temperature returned to normal it must not be assumed that the patient was completely cured. In addition the tympanic membrane must have resumed a normal appearance and the hearing have been fully restored. The basis of treatment should be early diagnosis, adequate dosage of penicillin, myringotomy when pus was present in the middle ear, and careful observation of the ear until it and the hearing were normal. Any unsatisfactory feature persisting more than two weeks should call for an otologist's opinion.

In the subsequent discussion Dr. A. J. MACLEOD (North Uist) asked how it was possible to make a satisfactory aural examination in infants and very young children. Mr. MUNRO BLACK replied that in many cases it was impossible. Dr. ELSIE WARREN (London) asked how the general practitioners could be sure that there was no otitis media when boils blocked the external auditory meatus. Mr. MUNRO BLACK said the same answer applied, though if the infection in the meatus was recurrent the tympanic membrane might be visible in the quiescent periods. Replying to a question about the effectiveness of oral penicillin in children, Mr. Munro Black stated that the evidence was incomplete, but oral penicillin was worth trying. Mr. S. W. ALLINSON (Boston) asked if it would not be most beneficial if parents trained their children to breathe properly. Mr. SIMSON HALL in reply, agreed that this would be so, and was a step in keeping with the modern tendency to stress prevention rather than cure. Dr. M. L. H. EVANS (London) asked if condemnation of the self-illuminating auriscope was advisable, since in his opinion this apparatus had prior place to the clinical thermometer and stethoscope. Mr. SIMSON HALL replied that the auriscope was very useful, but the head mirror was still needed for examination of the nose and throat. Dr. J. T. REES (London) asked Mr. Bateman what advice a school medical officer should give in a case of recurrent otitis with every cold, and should aural drops be used. Mr. BATEMAN replied that the patient should be examined by a specialist to determine the underlying cause, and that aural drops alone were not of proved value. Dr. G. HOYLE (Tamworth) asked whether the general practitioner should perform Eustachian catheterization when the drums were retracted after successful treatment with penicillin. Mr. BATEMAN replied that retracted drums in a child would probably be due to adenoids, which should be removed. Politzer bag inflation was preferable to catheterization. In reply to Dr. A. LAMONT (Inverness) who asked if there was any contraindication to the use of chloramphenicol locally plus systemic penicillin, Mr. BATEMAN replied that chloramphenicol was better avoided, as it commonly caused local reactions, especially in a repeat course. Dr. E. NOEL REES (Llanelly) asked whether the local application of penicillin was indicated. Mr. BATEMAN replied that local treatment was of no value before the drum had ruptured.

Upper Respiratory Tract Infections in Allergic Children

Mr. C. GILL-CAREY (London), a vice-president, then took the chair, and Mr. J. ANGELL JAMES (Bristol) opened a discussion on the diagnosis and treatment of upper respiratory tract infection in allergic children. In a series of 1,208 children he had seen recently 114 suffered from allergy. Examination was difficult because of the highly strung temperament not only of the child but often also of the parents. Further, the allergic reaction masked the appearance due to inflammation, and vice versa. Constrictor sprays might help in nasal examination, but often the nasopharynx could not be examined without a general anaesthetic. When allergy complicated infection swelling might interfere with sinus drainage, so delaying resolution. In chronic allergy the presence of infection was most difficult to recognize, because of infiltration and fibrosis due to the repeated allergic attacks. There was a strong tendency to lymphoid hypertrophy in allergic children. Recurrence of adenoids after operation was particularly common in such children. In investigation of the sinuses it was important to decide if there was pure allergy, pure infection, or a mixture of the two. Symptoms alone might lead to confusion, and skiagrams were very helpful. Histological examination showed that in uncomplicated allergic conditions there was, typically, an irregular swelling of the mucosa with no fluid collection. Proof punctures were not always reliable.

In the treatment of sinusitis conservative measures were sufficient in almost every case, vigorous anti-allergic treatment being employed at the time and continued after the infection had resolved. Surgery in these cases was hazardous. In conclusion Mr. James pleaded for the closest collaboration between paediatrician, allergist, and rhinologist.

Dr. T. A. BRAND (Newport, Mon) held the view that, in children suffering from allergy and infection, operations on

the upper respiratory tract sometimes aggravated the existing allergy or induced a fresh allergy. The paediatrician was of course more likely to see the failures after operation than was the surgeon. Great caution was needed before surgery was undertaken in allergic subjects. A history of recurrent and prolonged colds suggested the possibility of allergy plus infection. In addition to the more commonly recognized symptoms of allergy, a persistent, unproductive cough, worse at night than in the day and not responding to the ordinary remedies, was often complained of. Skin tests were, on the whole, disappointing, as also was specific desensitization based on such tests, though occasionally a dramatic cure might be obtained. Swabs of the posterior nares, allowed to remain *in situ* for at least a minute, often showed the presence of eosinophilia. Radiological examination could be most helpful.

Treatment should, so far as possible, be conservative. Besides avoidance of contact with the offending allergen, non-specific desensitization might be useful. Antihistamines were disappointing, except for promethazine hydrochloride, in seasonal rhinorrhoea. Theophylline with small doses of phenobarbitone sometimes helped. In combined sinusitis and allergy postural instillations of decongestants were sometimes useful, especially when combined with antibiotics in the early stages and with physiotherapy. Surgery should be undertaken only when recurrent severe upper respiratory tract infections had proved a serious handicap to the child's physical and educational development. The parents should always have possible sequelae explained to them, and rehabilitation exercises should always follow the operation.

Dr. J. PEPYS (London) described three ways in which allergy and infection might be associated—infection leading to the development of bacterial allergy (a view not generally accepted); infection predisposing to the onset of allergy by lowering the clinical threshold; and allergy complicated by infection, a common condition in which disturbed nasal physiology due to allergic mucosal swelling was the determining factor. Hence control of the allergy was essential if lasting results were to be achieved by treatment of the infection. In the diagnosis of nasal allergy a history of frequently recurring colds, lacking the usual sequelae, was important, in addition to sneezing and rhinorrhoea. Nasal itching was characteristic. Continuity of care over long periods was necessary, as the allergic state was apt to persist throughout life, though the nature of the allergen might change. From early infancy up to 4 to 5 years of age food allergens—for example, milk, eggs, chocolate, and nuts—were important, but in later years these were largely supplanted by inhaled irritants. In older children desensitization to inhaled irritants could help, but must be done for long periods. Ephedrine or antihistamines by mouth could be most useful, though prolonged administration might lead to anorexia and depression. Local nasal vasoconstrictors should be used with care, lest "rhinitis medicamentosa" developed. The potentially allergic infant should be recognized early, as this might well lead to a reduction in the incidence of allergic disorders.

The main speakers then answered a number of questions. In reply to Mr. R. G. MACBETH (Oxford), who asked, "Was the pneumococcus the commonest organism found in infection associated with allergy?" Mr. ANGELL JAMES stated that he had found the staphylococcus, streptococcus, and pneumococcus in that order of frequency. Mr. I. SIMSON HALL (Edinburgh) asked what decongestant was advisable, ephedrine or the longer-acting ones: to which Mr. ANGELL JAMES replied that ephedrine was used most, "privine" and "neophryn" occasionally. Mr. F. C. W. CAPPS (London) asked if it was often advisable to remove the allergic child from its parents for a time. Dr. BRAND replied that the child did very well, but on return home almost invariably relapsed. A long period of absence was necessary—say, two or three weeks in hospital, followed by a long convalescence, preferably not at the seaside. Dr. C. EISINGER (London) and Mr. A. MACKENZIE ROSS also contributed to the discussion.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Treatment of Acute Malaria

SIR,—In his letter (*Journal*, July 4, p. 41) Sir Gordon Covell, possibly unconsciously, has thrown a spanner into the therapeutics of malaria. As a sincere student of malariology may I be pardoned for asking, *"Quo vadis?"* And if a specialist in this subject finds himself in a quandary regarding the effective drug treatment of malaria, what must be the state of mind of the practitioner in the Tropics, and, more so, that of the unfortunate student who has to be examined on this subject?

Is the object of his letter a proposal of "back to Methuselah," which in this case indicates a return to quinine as adumbrated by his expression of a "more rapidly acting schizonticide"? If this should be the case then it is permissible to inquire why our old friend quinine has been so persistently relegated to obscurity in recent years. It has even been stated in an annotation (*Journal*, March 15, 1952, p. 590) that the use of quinine in the treatment of chronic *Plasmodium falciparum* infections should be discontinued altogether. If any other evidence were required of the present medley regarding the most effective treatments of malaria, it is to be found in the *Journal* of January 20, 1951 (p. 149), where a puzzling complex combination of drugs is suggested for the various forms of this fever.

A long procession of antimalarial drugs has been witnessed in recent years. Hardly has there been time to assess the merits of one before another, allegedly more powerful, synthetic makes its appearance. It is useful to reiterate at this juncture what Sir Samuel Gee is reported to have said: "Gentlemen, go on using your drugs just as long as they cure."

The difficulties of understanding the present situation commenced with the introduction of pamaquin ("plasmoquin") in 1926 by W. Roehl.[1] Up to this time nobody had had the temerity to suggest that any other drug could supersede quinine in the treatment of malaria. Unfortunately, it proved too toxic in routine use for man. Then came mepacrine in 1931, introduced by W. Kikuth,[2] and this had properties which appeared to outrival those of quinine. Although at first most doctors in Africa and in this country were disposed to despise it, yet mepacrine maintained its position until the outbreak of the second world war. Nobody ever suggested that its schizonticidal action was as rapid as that of quinine, though the combination of the two proved most efficacious in the treatment of acute subtertian malaria. The official Army view in 1939 was that mepacrine was too poisonous for mass administration to troops in spite of the fact that its prophylactic value had already been proved in Yugoslavia, U.S.A., and E. Africa.[3–6] Here these properties were not rated high at that time, so that it was not until 1942 and the fall of Java that the shortage of quinine forced the attention of malariologists to the potentialities of mepacrine as a prophylactic as well as a curative drug, with the result that malaria was banished as a dominating factor in the war in the Far East. All this is now a matter of history, but we have reached the stage when the virtues of quinine as a powerful schizonticide have already been forgotten by many of the present generation of doctors. The end of the war (1945) saw the introduction of proguanil,[7] which was the result of intensive research and represented an achievement of great scientific value. The first reports from Liverpool (1945–6) on the treatment of both subtertian and benign tertian malaria were so favourable that they made a very wide impression. To commence with, the doses were so small as to suggest an almost ultra-optimistic attitude. Similar claims were made for its prophylactic properties, the dose for which was stated to be 100 mg. once a week. As the years rolled on the fallacies of this appraisal have become apparent and *pari passu* the doses of proguanil have been stepped up, so that its advocates now suggest as a curative dose for subtertian malaria 12 times that advocated in 1945. But at the present moment, as Sir Gordon states, its value as a powerful schizonticide in this disease is more than doubtful as its action is far too slow, even

in these large doses. Furthermore, another difficulty in the mass treatment of malaria has arisen in the facility with which resistance to this drug is acquired, and this has led to a further increase in the prophylactic dose of proguanil. In order to counteract this tendency some modern workers have been led to advise the combination of quinine with proguanil to increase its effective action. This suggestion begs the question of why one should employ proguanil at all under these circumstances, since it is considered to play such a minor part in extirpating the malaria parasites. Now we have pyrimethamine, which is the latest comer on the stage. In this case, as related in recent issues of the *Journal*, the story appears to be following the proguanil model. At first minute doses were advocated, 25 mg. a day; then, after a few months' delay, papers are published portraying optimistic results, especially in subtertian malaria, and then others follow which appear to give the opposite impression,[8–10] but Sir Gordon writes that, as in the case of proguanil, in subtertian malaria pyrimethamine should not be used unless in combination with a more powerful schizonticide. One principle seems to emerge from this conflicting mass of evidence—namely, that when the 8-aminoquinolines, such as pamaquin, were introduced, the therapeutic dose was too large, and the longer the drug remained in use the more consistently was it reduced. In this case it was from 0.12–0.03 g. daily. In mepacrine, which at first was thought to have no side-effects, the reverse has happened and it has risen from 0.3–0.6 g. daily, or even higher, with the result that patients are made actually ill; but in the less toxic compounds, such as proguanil and pyrimethamine, the therapeutic doses become increasingly bigger and bigger as time goes on, and even then, as Sir Gordon states, they do not appear to be powerful enough to halt a subtertian attack.

This letter is not to be taken as a disparagement of these antimalarials which have been forged as a weapon in the fight against malaria, nor is it asserted that the disappearance of malaria from great tracts has not been, in some measure, due to their mass application, but I would like to stress the danger of discarding old friends for new without due consideration. It takes a long time to digest all this new information, and it also takes many years for an antimalarial drug to establish a permanent and lasting reputation, so I am glad to see that this question is so fairly and adequately handled in the newly published book *Clinical Tropical Diseases*, by A. R. D. Adams and B. G. Maegraith.—I am, etc.,

London, W.1. PHILIP MANSON-BAHR.

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Experiences with Pyrimethamine in Kenya

SIR,—The results obtained by Sir Gordon Covell with pyrimethamine ("daraprim") in preventing non-immune subjects from developing malaria (*Journal*, May 16, p. 1081) are of special interest to practitioners working in malarious areas, such as the Kenya Highlands, where the disease is encountered very often among non-immune Europeans.

Our malaria is almost entirely sub-tertian, and this season it has been exceptionally severe. Numbers of settlers have been using pyrimethamine for prophylaxis, in the manner recommended by the manufacturers. The results which I have personally encountered have not borne out the claims made for this drug, though maybe many have been satisfactorily protected and therefore have not been seen by a doctor. But the fact that there have been fairly frequent failures is of sufficient importance to put on record, as most of the cases occurring after the use of pyrimethamine have been severe, and one, my own child, was nearly fatal.

I have recently treated three cases of malaria in children under 3 years old who had taken their half-tablet of pyrimethamine in the week before the attack. All these commenced with convulsions and the one noted above was an exceptionally severe case. All required intramuscular quinine and sedatives; one of these cases had a positive blood slide. Two other cases in children under 2, both with positive blood slides, had diarrhoea or vomiting. Two adult men whose slides were negative had severe attacks. Thus there were seven cases, all severe, all of whom so far as could be ascertained had used pyrimethamine as a prophylactic. One other case serves to illustrate a characteristic of this drug which also can be dangerous or fatal. A boy aged 20 months swallowed about 15 tablets while in apparent perfect health. He developed convulsions in about three quarters of an hour which resisted all treatment, and he died two hours later. Necropsy showed cerebral congestion. Histological section did not confirm this, but did show congestion of both kidneys. Chemical examination of the stomach contents showed in various tests a substance which gave identical results to pyrimethamine. This was done to exclude the presence of any other poisonous substance. Two other cases of children consuming up to about 15 pyrimethamine tablets have occurred recently in this area, but the results were not severe. These cases underline the fact that the drug has a relatively attractive taste, and therefore needs to be carefully locked up.

Returning to the prevention of clinical cases of malaria, I would like to suggest that when research is carried out on a new antimalarial drug it should be tested not only on volunteers in Europe, or on the indigenous inhabitants of malarious areas, who probably have a high degree of immunity, and on whom pyrimethamine, at least, works exceedingly well, but also on Europeans living under normal conditions of life in the Tropics. These might well be subdivided into (*a*) infants, (*b*) children, (*c*) adults recently arrived in the Tropics, (*d*) adults with a long residence and history of many attacks of malaria, and (*e*) adults with long residence and few or no such attacks. Infants and children could be subdivided into those born in malarious regions and those entering at an early age from abroad. The clinical cases of malaria which are used in the experiments or trials also need careful definition into the various well-known types and grades of severity. It is not enough to say that malaria is prevented or attacks are controlled by a given dosage of a particular drug. The practitioner wants to know whether he can rely on a drug both to treat and prevent pernicious attacks of subtertian malaria, and the milder relapsing types in all cases and under all circumstances. Furthermore, malaria has strange variations in virulence in the same district which require consideration.

It may be that if the records of private practitioners in tropical countries could be made accessible to research workers, they would find much information of the nature indicated, and which would act as a useful check on their own highly controlled experiments.—I am, etc.,

Eldoret, Kenya. R. Y. TAYLOR.

Post-inoculation Poliomyelitis

SIR,—Dr. James Grant, in his article on post-inoculation poliomyelitis (*Journal*, July 11, p. 66) describes eight cases which occurred in South Tyneside during 1952. Of these, four are shown as having followed the use of combined diphtheria and pertussis prophylactic, but I cannot gather from the text whether the diphtheria portion of this was alum-precipitated or not. He merely describes the material as combined diphtheria toxoid and pertussis vaccine.

I should be glad to know whether the diphtheria component of this material did contain aluminium hydroxide or not, as I think it is a matter of some importance. Admittedly pertussis vaccine alone is apt to be irritant, but there is no doubt that the combined prophylactic containing alum is even more so. To this end I devised a combined prophylactic of pertussis vaccine containing purified fluid diphtheria toxoid without mineral carrier, which I have been using subcutaneously for the best part of three years. This produces no more local reaction at the seat of inoculation than does the same pertussis vaccine when given alone. The Schick-conversion of this material, given as three injections at monthly intervals, is just a fraction under 100%, on observation of over a thousand cases three months after the final injection. The same applies to purified fluid toxoid (Holt) given as three-monthly subcutaneous injections of 0.5 ml. (30 Lf), and for primary immunizations in young children it will be found to cause virtually no reaction at all. It should not be used for boosting doses in older children. The Schick-conversion rate here is also near-optimal three months after the last injection.

Thus I think that the last point of Dr. Grant's summary, that "manufacturers of prophylactics should aim at the production of antigens which will be satisfactory in every way, when given by subcutaneous injection," is already answered. A combined prophylactic, to my original formula, is available from Messrs. Parke, Davis & Co., as W.D.P. (Red), and similar preparations are now marketed by Messrs. Burroughs, Wellcome & Co., and Messrs. Glaxo. The plain fluid toxoid, for use when there is any risk of poliomyelitis in an area, is also available from Messrs. Parke, Davis & Co., and I believe also from Messrs. Burroughs, Wellcome & Co.

I have used nothing but subcutaneous injections ever since I felt that this route might be better for avoiding paralysis.—I am, etc.,

London, S.E.5. G. BOUSFIELD.

Clinical Research in the N.H.S.

SIR,—In the otherwise encouraging White Paper on this subject[1] it was disappointing to find in paragraph 6 a tacit assumption that "systematic investigations undertaken deliberately and often over long periods" were somehow not within the province of general practitioners but only of ". . . whole-time clinical professors and clinical research workers . . . university professorial units . . . research units of the M.R.C. and . . . private research foundations." It might not be out of place to remind your readers of the "systematic investigations undertaken deliberately and . . . over long periods" by Sir James Mackenzie, whom you mention in your editorial,[2] by Dr. W. N. Pickles, and by others.

The same assumption seems to underlie the omission of executive councils from among those local bodies which would be authorized to control decentralized Exchequer funds.

It would be unfortunate if the new impetus given to research in general practice by recent events was impeded by any organizational defects that were unwittingly allowed to creep into this otherwise admirable proposal to enrich the life-blood of clinical research throughout the Health Service.—I am, etc.,

Peaslake, Surrey. G. I. WATSON.

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A Human Chimera

SIR,—A report in the lay press describes the case of Mrs. McK. (see *Journal*, July 11, p. 81), who is stated to have been "the first human being in medical history with a double set of blood groups." Sir, I beg to differ. In 1943 I joined the Royal Air Force for aircrew duties, and when they typed my blood it was found to be OA. I left England in 1947 for Canada, and the next time I had my blood typed was in 1949 for the blood bank up there. After testing they told me they did not think it necessary for me to donate any. They found it the same, OA. In the Air Force I never came across anyone else with the same group, which fact got me a little worried. However, no matter how many medical officers or laboratory technicians I asked about it, they either would not, or could not, tell me anything, except that I was as healthy as anyone else.

Like the lady mentioned I, too, am a twin. My twin brother still lives in England, and neither of us have had one day's real sickness in about forty years—we are 43 years old. I have a son, 20 years old, who has just got his commission as a fighter pilot in the Canadian Air Force, and my brother has a son and a daughter who are as healthy as the rest of us.

Whether this information will be of any use to you I do not know, but at least I have at last got a definite explanation of what my blood group, OA, stands for.—I am, etc.,

California, U.S.A. S. BARON.

The Doctor in the Witness-box

SIR,—Viscount Simon in his interesting Cavendish Lecture on the doctor in the witness-box (*Journal*, July 4, p. 1) makes the important observation that the case of the mother who destroys her child is hard to fit into the M'Naghten Rules, but in practice a verdict would be returned which recognized the defence of insanity. I was in a case some years ago where a mother killed her child on learning he was a mental defective—first trying gas then strangulation—because she so dreaded the suffering she imagined in store for him. She was in a highly strung emotional state, but not psychotic, when she performed the act. The case was taken by a very serious judge who asked the jury whether it "really thought she knew what she was doing was wrong?" The jury returned a verdict of guilty but insane in conformity with humanity and common sense, as Viscount Simon supposes.

But since then the Court of Criminal Appeal has ruled that "not knowing the act was wrong" only means not knowing it was contrary to the law. If this is strictly applied in murder, then it virtually excludes every case; only those who were so confused at the time that they did not know the nature of the act, or are so mad as to be unfit to plead, or are idiots, can be said not to know that it is illegal to kill.

One of the defences in favour of the M'Naghten Rules put forward to date is that they have worked, and most of us would agree. But, as Dr. Hobson has remarked, this is not so much due to their intrinsic merit as to the way judges have applied them. But this decision of the Court of Appeal surely rules out a verdict such as in the case cited? For it also stipulated that for the prisoner merely to have thought the act justified was not enough. Yet this is the essence of the case with depressives. They are so depressed that they become suicidal and do not want to leave their loved ones behind, or so deluded that they want to spare others the supposed miseries of this world. Clearly in both cases their judgment is completely unbalanced, and they feel their act justified morally, but they are not so bereft of reason that they do not know that to kill is against the law. Yet the Court of Appeal's ruling makes this the only criterion.

I am not writing this from the motives of supposed sentimentality of the psychiatrist, but because crimes committed as a result of genuine depressive states are those where not only the public but judges, and indeed Viscount Simon himself, feel the criminal should be treated (in an institution of course) yet should not pay the supreme penalty. But if the M'Naghten Rules are to be applied without any flexibility how can they work in these cases? I am not a lawyer, and I would be exceedingly interested to know Viscount Simon's views.—I am, etc.,

London, W.1. W. LINDESAY NEUSTATTER.

Intravenous Barbiturates for Drunkenness

SIR,—Dr. A. M. Bartley's letter (*Journal*, July 11, p. 95) dealing with my criticisms of his treatment for obstreperous cases of drunkenness is, I believe, based upon certain assumptions which could lead to serious mishaps were they widely accepted by casualty officers or by any practitioners whose duty involved treating cases of this kind.

I am not advocating routine stomach wash-out as a preliminary to thiopentone administration to those cases of violent drunken disorientation, but stand by my original condemnation of this therapy. I have indeed attempted to wash out the stomachs of obstreperous drunks amidst a flurry of fists and to the accompaniment of much choking and retching. It is the difficulty of this traumatic procedure, and the uncertain degree of success obtained in thoroughly removing the contents of the overloaded stomach, which would make me loath to administer an intravenous barbiturate to these individuals. Moreover, the performance of this manœuvre has often demonstrated that the stomach

has by no means been emptied even by the spontaneous vomiting which has occurred during the stage of obstreperous behaviour.

Certainly the dangers of "silent regurgitation" and glottic spasm are every bit as great in certain types of emergency surgical cases—particularly cases of intestinal obstruction. It is for that very reason that many anaesthetists in these cases avoid a thiopentone induction at all costs and induce anaesthesia by a slower, safer inhalation technique, at least until the airway has been safeguarded by some means such as cuffed endotracheal intubation. If in such cases thiopentone induction is used, then it is established practice among many anaesthetists to lessen the risk of regurgitation by placing the patient in a slight reverse Trendelenburg tilt prior to injection and, in any case, by performing the induction with a sucker ready at hand for immediate use.

In conclusion, I feel that if thiopentone were widely used as a means of quieting unruly drunks, desirable though this end may be, without the facilities of an anaesthetic-room available, there would be introduced a far graver hazard to life than if intramuscular paraldehyde or apomorphine were substituted.—I am, etc.,

London, W.2. PETER NOBES.

Phenylbutazone

SIR,—The toxic reactions after phenylbutazone ("butazolidin") therapy given for various arthritic conditions are well known, and include anorexia, nausea, vomiting, diarrhoea, dermatitis, palpitations, and, finally, agranulocytosis and sometimes complete aplasia of the bone marrow. The importance of these reactions has been stressed in many recent articles and in particular by Drs. J. R. Nassim and Thomas Pilkington[1] and by Dr. J. C. Leonard.[2]

I have taken 28 consecutive cases of rheumatoid arthritis, 20 of osteoarthritis, and two of gout which have been treated with this drug. The majority had 0.2 g. three times a day, reducing the dose in many instances to 0.2 g. once a day. Seven received intramuscular injections of 1 g. twice a week, reduced to 1 g. once a week after one month. The majority of the patients have been treated in this way for nine months and none for less than three months. All those with severe symptoms were admitted into hospital and the effect of the initial doses of phenylbutazone carefully assessed. After discharge from the wards they joined the others attending the out-patient department at intervals varying between one and three weeks. The possibility of toxic symptoms occurring was explained to each one, and they were told to stop the drug immediately if this happened and to report back to the clinic the following week.

All the toxic reactions which I have experienced have been mild and have either responded to a reduction in the dose or disappeared spontaneously without any interference. There was only one exception. Severe vomiting in this instance caused the drug to be stopped. The toxic symptoms encountered in this series of 50 people were: palpitations 1, conjunctivitis 1, nausea 9, vomiting 5, swelling of eyes 2, pruritus 1, diarrhoea 2, dermatitis 4, ulcerated gums (without agranulocytosis) 2.

Twenty-seven of the 50 patients, therefore, experienced some unpleasant symptoms, and this was higher than reported by Nassim and Pilkington (46 out of 109), is about the same as that reported by Cudkowicz and Jacobs,[3] but higher than the average of 22% quoted by Leonard after a review of the literature. My results have differed from those of Nassim and Pilkington in one important respect: it was only necessary to stop the drug once, whereas they had to withdraw the drug in 46 out of 109 patients.

Out of the 28 patients suffering from rheumatoid arthritis, 21 had a very good result, three a moderate result, and one was made worse. Out of the 20 cases suffering from osteoarthritis, a very good result was obtained in 13, moderate in three, and complete failure in four. Both those suffering from gout were almost cured. Forty-two out of the 50 cases have derived considerable benefit from this drug: this figure is much higher than that quoted by Nassim and Pilkington (59 were greatly improved out of a total of 109).

The only other treatment for rheumatoid arthritis which has gained any popularity is that with injection of gold salts, and favourable results with this therapy have been few and troublesome complications due to dermatitis, liver and kidney damage, etc., have been frequent. Furthermore, there is no other drug known which will effectively alleviate the pain in osteoarthritis. The treatment of gout with colchicum, cinchopen, or salicylates is uncertain. These facts must be taken into account before too much emphasis is placed on the toxic side-reactions of phenylbutazone.—I am, etc.,

Birmingham, 18. R. O. GILLHESPY.

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Bornholm Disease

SIR,—The numerous excellent descriptions of the 1951 epidemic of Bornholm disease, or, as our Norwegian colleagues prefer, epidemic pleurodynia (*Journal*, June 20, p. 1345), and the letters from readers indicate a widespread interest among British physicians in the events of that late summer. Laboratory studies provide evidence of the responsibility of Group B Coxsackie viruses, as pointed out in your leading article (p. 1379). Type B3 apparently was prevalent. It also accounted for epidemics in the U.S.A. in 1950 and 1951, and was identified in Australia the same year. It may have been responsible for the epidemic on the Continent as well. We must wait for more information from the laboratories. Meanwhile it is worth noting that while B3 has now been repeatedly implicated, another type, B1, which has not appeared for some years, was the aetiological agent of the American cases in 1948 which led Dr. Curnen to suggest that Coxsackie viruses might be the cause of Bornholm disease.[1]

The virologists can be relied upon to solve the question of how many types cause Bornholm disease by comparing their strains and identifying them in terms of a common terminology. Meantime a second point which may have more general interest seems to have attracted little attention in Great Britain. It is whether poliomyelitis and Bornholm disease ever occur simultaneously. The records indicate that 1951 was a relatively light poliomyelitis year in England and Wales, but I find no comment regarding the concurrence or competition of the two diseases. This has attracted attention in the past.

The first statement to come to my attention was that of Gsell,[2] who described a 1940 epidemic of Bornholm disease in Canton Appenzell and mentioned that an epidemic of poliomyelitis did not occur in 1940 and that "not a single case of infantile paralysis appeared during that summer and fall in Gais and Teufen." Linberg,[3] I have since found, made a similar comment regarding a Norwegian outbreak in 1934. There are others. Lazarus,[4] describing the epidemic in the State of Washington in 1950, the first association of type B3 with Bornholm disease, wrote, ". . . only one case of paralytic poliomyelitis occurred in Hoquiam during the 1950–1 season, when the pleurodynia epidemic took place. The incidence of poliomyelitis in Grays Harbor County during the same season was about 15 per 100,000 population. Preliminary data indicate that the same thing is happening this year, with cases of pleurodynia again appearing and paralytic poliomyelitis being at a low level." Gabinus, Gard, Johnsson, and Pöldre[5] investigated an outbreak in south central Sweden in 1950. They mention, "No cases of paralytic poliomyelitis appeared in this region."

During 1951 the disease was widespread in southern Germany. Gärtner[6] wrote, "In no place where Bornholm disease occurred was a single case of paralytic poliomyelitis recognized." And from Stuttgart, Windorfer and Born[7] reported, "Interestingly in the same period only one definite case of paralytic poliomyelitis occurred in Stuttgart."

Dr. R. L. Huebner tells me there was not a single case of poliomyelitis in the Texas counties in which pleurodynia was prevalent during 1951, but there was little or no poliomyelitis the following summer as well. He established a type B3 virus as responsible for the outbreak. On the other hand, a type B3 virus appears to have caused widespread disease in Sydney, Australia, late in 1951, and Dr. Stanley[8] was greatly impressed by the coincidental disappearance of poliomyelitis. It had been prevalent the previous year and returned in force in 1952. Most recently I find a description of an epidemic in Reykjavik, Iceland,[9] and the comment, "In this period no cases of anterior acute poliomyelitis or aseptic meningitis were reported."

I mention these observations in the hope that readers of the *Journal* may have evidence that bears on the point.

Proof of an interference between the two in nature may be difficult to establish. Certainly all we have so far is merely suggestive. But the evident interest of your readers in the epidemic leads me to think they may have confirmation, and I would be grateful to them for their comment.—I am, etc.,

Albany, New York. GILBERT DALLDORF.

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9 *J. Amer. med. Ass.*, 1953, **152**, 814.

Prognosis in Diabetic Pregnancy

SIR,—In his interesting article (*Journal*, June 27, p. 1413) on the prognosis in diabetic pregnancy Dr. Wilfrid Oakley states that his results fail to confirm the existence of any direct relationship between age of onset of maternal diabetes and foetal loss. As mentioned in the article, this relationship was found by me,[1] but in a series of babies *weighing 2,500 g. or more from patients without adiposity*. Dr. Oakley uses for his study of this point his total King's College Hospital series (267 of 275 babies), and this may be the reason why the relationship was not found by him.

To get a clearer concept of the *causes* of the high foetal mortality and of what might be accomplished by a certain treatment, one has to know something of the "natural" prognosis in different groups of patients. The two most important factors seem to be parity of the mother and age of onset of diabetes,[1 2] which cannot be influenced by any treatment. To use a total material for analysis without classifying may obscure everything but the gross mortality.

In his section on foetal hypoglycaemia, Dr. Oakley concludes that this problem clearly needs further study. I am inclined to draw the opposite conclusion. From what Dr. Oakley tells us it is evident that no relationship exists between foetal hypoglycaemia and neonatal death. In my rather extensive work[3] on this topic I came to the same result. Since 1946 the newborn infants have not received glucose at the lying-in department B of Rigshospitalet, Copenhagen. It is a characteristic feature of the newborn young of mammals that they can stand a low blood sugar.—I am, etc.,

Copenhagen. JØRGEN PEDERSEN.

REFERENCES

1 *Trans. XIIth Brit. Congr. Obstet. Gynaec.*, 1949, p. 186. Austral Press, London.
2 *Ugeskr. Læg.*, 1951, **113**, 1771.
3 *Diabetes and Pregnancy. Blood Sugar of Newborn Infants*, 1952, p. 230. Danish Science Press, Copenhagen.

Tropical Diseases in Britain

SIR,—May I be allowed to draw attention to the following points raised in your annotation, "Tropical Diseases in Britain" (*Journal*, May 16, p. 1096)? I entirely agree with Professor W. Melville Arnott's insistence in his letter (*Journal*, May 30, p. 1219) that time must not be lost in starting therapy in cases of malignant tertian malaria, and that in the seriously ill patient intravenous quinine is the most effective treatment.

The writer of the annotation claims that "true hookworm disease occurs only in debilitated populations suffering from heavy infestations superimposed on malnutrition and the avitaminoses; it is not seen in the well-nourished." In the last year I have seen many Europeans carrying ankylostoma ova who were not suffering from "true hookworm disease," but I have also attended two senior officers who were suffering from ankylostomiasis, the clinical features including the rash, pulmonary symptoms and signs, and a heavy intestinal load of parasites, resulting in both cases in severe debility. Both these officers were harassed, frustrated, and overworked, but neither was, or had been, malnourished nor presented any feature of the "avitaminoses."

The other statement in the annotation with which I cannot agree is that "emetine . . . should find no place in the diagnosis" of amoebic dysentery. In my experience the patient who suffers from dysentery which does not respond to phenylsulphathiazole in adequate dosage, and in whom *Entamoeba histolytica* or its cysts cannot be found on examination of several stool specimens, very frequently produces amoebae or cysts in the stools after one dose of 1 gr. (65 mg.) emetine. Further, the case of "pyrexia of unknown origin" in the Tropics may be due to amoebiasis, and if it has been impossible to find a cause for the illness, it is worth trying a course of emetine as a diagnostic measure.

In this part of the world a doctor or a laboratory technician is not expected to be an "experienced pathologist" in order to be able to detect the presence of *E. histolytica* or its cysts in a specimen of faeces, or to be able to differentiate such protozoa from the free forms or cysts of entamoebae which are at present considered to be of little pathological importance.—I am, etc.,

Kaduna, Northern Nigeria. BRUCE NICOL.

Medical Auxiliaries

SIR,—The letter from Dr. A. P. Cawadias (*Journal*, July 11, p. 96) appeals on somewhat emotional grounds for "equal rights" under the N.H.S. for the three associations of physiotherapists he mentions. The Ministry's only interest in this matter should be in the standard to which medical ancillary bodies shall be required to attain before their members are accepted for employment in the N.H.S., and the absence of any reference to such standards in the Ministry's recent proposed regulations is a cause of considerable concern to many members of the medical profession.

Most of us have in the past relied upon members of the Chartered Society of Physiotherapy, because we know that they have undergone a full-time three-year training at one of the recognized hospital training schools. The published report of the evidence given before the Cope Committee gives little evidence of similar standards of training being required by the other associations mentioned by Dr. Cawadias. It was possibly for this reason that the Cope Committee felt it could not recommend the acceptance of the certificates of these associations for employment under the N.H.S. It may be, however, that further information is now available regarding the training syllabus of these bodies, and where it is carried out; if so this would be of considerable interest in view of Dr. Cawadias's plea.—I am, etc.,

London, W.1. W. S. C. COPEMAN.

POINTS FROM LETTERS

Cord Traction

Dr. JAMES T. BURROWES (Jamaica) writes: May I be allowed to record my support of Dr. F. C. R. Picton (*Journal*, April 18, p. 887) and the Brandt-Andrews method of placental extraction? This method gives such good results that the routine use of ergometrine intravenously before the commencement of the third stage would appear to be unnecessary.

Treatment of Herpes Simplex

Dr. GORDON J. C. HERD (Elstree, Herts) writes: During the past year I have treated a number of cases of herpes simplex by the application of 10% chloramphenicol in propylene glycol. The eruption in most cases was confined to the lips, the first manifestation having presented some 12 to 24 hours previously. The area involved is washed with soap and water and then painted with the solution, which is left to "dry in." Treatment is repeated twice daily (morning and evening) for about three days. Following the initial application, local discomfort is alleviated, no further extension of the lesions occurring. Within 36 hours there is a marked diminution in the size of the vesicles. These generally break down by the third or fourth day, leaving small areas of granulations which subsequently heal. The only disadvantage I have observed is the unpleasant taste of the preparation should it find its way into the mouth. This effect, however, is evanescent.

Obituary

GERALD SHEEHAN, M.B., Ch.B.

The sudden death on July 11 of Dr. Gerald Sheehan at the age of 54 has removed from the civic and medical life of Carlisle one who had been an outstanding personality in his native city for over 30 years.

Born on June 6, 1899, the eldest of a family of 13, Gerald Sheehan graduated from Manchester University at about the time of his 21st birthday by taking the degrees of M.B., Ch.B. in 1920. He then took over the large general practice established by his father, Dr. Patrick Sheehan, who in his day was also a notable figure in Carlisle and who died the year before his son qualified in medicine. It was a considerable responsibility for a young man to bear, as in addition to the rough-and-tumble of general practice he had to consider the education of a large family, some of his brothers and sisters being already students of medicine. In all, seven members of the family became doctors. In this task Dr. Sheehan had the support of his mother and the benefit of her counsel and advice.

In 1930 he was elected to the Carlisle city council, and six years later he became chairman of its health committee. In 1949 he was unanimously voted to the mayoral chair. His professional and civic attainments made him admirably suited for the chairmanship of the Carlisle Executive Council, an office he held at the time of his death. He was also chairman of the local medical committee.

A kindly and friendly man, Gerald Sheehan had no enemies and was a good colleague, always willing to lend a hand. In time of stress or difficulty no fellow practitioner ever appealed to him in vain. In his professional duties he was ably supported by his sister, Dr. Kathleen Gillow, who carries on the practice. A devout Roman Catholic, he served his Church in many ways. For these services the Pope appointed him a Knight of the Order of St. Gregory. To his widow, formerly Miss Dorothy Johnson, and his three children and to his mother and the other members of the family the heartfelt sympathy of his colleagues is extended. —W. F.

R. J. W. MAWHINNY, C.B., L.R.C.P.&S.I.

Colonel R. J. W. Mawhinny died at Nottingham on July 16 at the age of 85. Robert John Watt Mawhinny was born on December 4, 1867, the youngest child of the late Dr. Thomas Mawhinny, of Mount Nugent, Co. Cavan, Ireland. As a young man he distinguished himself as a student and as a sportsman. He was awarded the gold medal for operative surgery at the Carmichael School of Medicine, Dublin, where he qualified L.R.C.P.&S.I. in 1888 at the early age of 20, and in the same year he won the Ormonde Cup for Ireland as a swimmer.

In 1890 he entered the R.A.M.C. and thus began a notable career in the Army which was to last 34 years, nearly all of which were spent in service abroad, 23 of them in India. During the South African War he took part in the defence of Ladysmith and was present at the engagement of Nicholson's Nek. He was mentioned in dispatches and received the Queen's medal with six clasps.

Earlier he saw service with the Isazai expedition of 1892, the Chitral expedition in 1895, and on the Punjab frontier in 1897–8, receiving the medal and clasp. In 1907 he took the D.P.H. of the Irish Royal Colleges. Promoted to lieutenant-colonel in 1912, he returned to India on the outbreak of war in 1914 after a short period of duty in Ireland. For his active service on the North-west Frontier with the Mohmand expedition in 1915, as A.D.M.S., Peshawar Division, he was mentioned in dispatches, and in the following year he was appointed C.B. By that time he was in Mesopotamia as A.D.M.S., Lines of Communication, Indian Expeditionary Force "D," and distinguished himself further by evacuating casualties by river in very difficult circumstances. He was invalided back to India and appointed A.D.M.S. to the Mari Field Force "B," for which service he received a further mention in dispatches. His promotion to colonel in 1921 was antedated to 1918, and in 1922 he held the appointment of D.D.M.S., Southern Command, India.

After his retirement from the Army in 1924 he went to live at Exeter, where he was in medical charge of troops from 1926 to 1932. Re-employed as an Army medical officer from 1939 to 1944, he was thus able to continue a happy association with the Devonshire Regiment which began when he was a young regimental medical officer during the South African War. Next to medicine his great interest was sport, for all forms of which he was naturally gifted. Apart from his prowess as a swimmer, he was a good swordsman, an excellent horseman, and a first-class shot. His life-long hobby, however, was fishing with the dry fly, preferably one he had tied himself. He married Miss Kathleen S. McEntire and there was one daughter of the marriage. Mrs. Mawhinny died in 1950.

F. V. NANKA-BRUCE, O.B.E., M.B., Ch.B.

Dr. F. V. Nanka-Bruce, a general practitioner well known on the Gold Coast, died on July 13 at the age of 74. He was president of the Gold Coast Branch of the British Medical Association.

Frederick Victor Nanka-Bruce received his early education first at the Government Boys' School, Accra, and then at Queen's College, Lagos, Nigeria. On his return to the Gold Coast he entered Government service as a dispenser and was attached to the expedition which went to Kumasi in 1900—an event which precipitated the last Ashanti War—and with the Governor of the Gold Coast, Sir F. Hodgson, and his party he was besieged in Kumasi Fort until the expedition managed to escape through the Ashanti lines to the coast. Shortly afterwards Nanka-Bruce was sent to Edinburgh University to study medicine, and he duly graduated M.B., Ch.B. in 1907. He then returned to Accra, being the second African to practise medicine in the Colony.

He built up a practice which, at the time of his death, had assumed very large proportions. His name in that part of West Africa came to be regarded as synonymous with scientific medicine and for the efficient treatment of disease sympathetically carried out. Dr. Nanka-Bruce had a very full life. He represented the best type of general practitioner, and he had a high regard for the standing of his profession. The old and the poor were always assured of an understanding reception at his hands, and he gave free treatment and financial assistance to many of the poor of Accra, among whom he spent most of his life. Apart from medicine, which remained his main interest up to the time of his death,

Dr. Nanka-Bruce served his country in a variety of ways. He was a member of the Legislative Assembly from 1931 to 1935 and again in 1946. In 1935 he was appointed O.B.E., and in 1937 he was a representative of the Gold Coast at the Coronation of King George VI. For many years he was a member of the Accra town council, and in 1949 he served on the Coussey Commission which drafted the present Constitution. In 1918 he founded the Independent Press, which produces the *Accra Daily Echo*, and of which he was managing director up to the time of his death. He was also a founder member of the Accra Turf Club, and was chairman of the board of stewards from 1943 to 1944, being himself the owner of racehorses.

Deeply interested in education, Dr. Nanka-Bruce served on the Achimota College Council and was manager of the Accra Royal School and chairman of the board of the Accra Academy. The confidence and esteem in which he was held by his fellow practitioners were shown by his election to the presidency of the Gold Coast Branch of the British Medical Association last February. His death leaves a gap in the public life of Accra which will not be easily filled. He was a good doctor and a good man whose counsels were respected and opinions valued.—H. B. L. R.

Medical Notes in Parliament

Cost of Social Services

During the debate in the House of Lords on July 21 on the motion for the second reading of the Finance Bill Lord SHEPHERD said there had not been a very great increase in the last few years in expenditure on the social services. The cost of these in 1938–9 represented 9.2% of the then national income. In 1950–1 the cost was 11.7%, and in 1951–2 it became 11.5%. If the conditions of the population in 1938–9 had been the same as in 1951, from £50m. to £80m. would have had to be added to the cost of the social services, bringing the proportion of expenditure from the national income for 1938 to the level of last year.

The Bill was read a second time and subsequently passed.

Payment of Scientists

During a debate on July 20 on science and productivity Sir HUGH LINSTEAD said the House of Commons had to face the problem of the proper payment of scientific teaching personnel in universities. The same problem had been faced and overcome in medicine. When consultants in the full-time employ of the National Health Service were able to get £5,000 a year from the State, it was no longer possible to employ professors of medicine in the universities at, say, £2,500 a year if men of the right calibre were needed. The universities therefore had to upgrade the status and pay of professors of medicine. The same problem had to be tackled in relation to professors of engineering.

Replying to the debate, Sir WALTER MONCKTON said a programme of research was being launched under the auspices of two committees set up by the Department of Scientific and Industrial Research and the Medical Research Council. Leading industrialists would sit down with professors to think out what could be done to improve the position.

Cost of Prescribing

Colonel STODDART-SCOTT on July 23 asked the Minister of Health what immediate steps he proposed to take to encourage doctors to reduce the present high cost of prescribing and so release funds for improvement elsewhere in the National Health Service.

Mr. IAIN MACLEOD replied that, without prejudice to their right to prescribe whatever they thought necessary in an individual case, he had recently invited all doctors to re-examine the cost of their prescribing. They had been supplied with lists of proprietary preparations classified by the Joint Committee on Prescribing. He had suggested to doctors that they should not prescribe other proprietary preparations without first comparing the cost with that of equivalent or similar standard preparations; and had reminded them of the need for proper economy when prescribing standard products. He had been assured of the co-operation of the medical profession in the efforts to keep the cost of prescribing within proper limits.

Peptic Ulcer

On July 23 Dr. BARNET STROSS asked the Minister of Health what estimate he had of the numbers of citizens suffering from duodenitis and from gastric and duodenal ulcers. He also asked how far liquid milk was still advised by his department in treating these conditions.

Mr. MACLEOD replied that no figures were available for duodenitis, but it was estimated that about 1 person in 100 in England and Wales suffered from gastric or duodenal ulcer. There was no evidence of any material change in total numbers in recent years, but the number of deaths from duodenal ulcer had increased and that from gastric ulcer had fallen. Responsibility for the treatment of patients must rest with the doctors in charge. His department did not issue advice in these matters.

Unfilled House Appointments

Mr. W. NALLY asked the Minister of Health on July 23 what advice he had given, or what assistance he proposed to render to, the Wolverhampton Hospital Management Committee, which, as a consequence of being unable to fill house posts in the Royal Hospital, Wolverhampton, had been compelled to circularize all industrial first-aid posts in the area asking them to avoid sending patients other than urgent cases to this hospital.

Mr. MACLEOD said he was having an inquiry made. The shortage of junior medical staff in hospitals was general in the region.

Anaesthesia for Childbirth

Miss PAT HORNSBY-SMITH said on July 23 that, while Mr. Macleod had seen a number of allegations about inadequate provision of anaesthesia or analgesia for childbirth, he had only two complaints from mothers in the last two years. In areas where the administration of gas-and-air by midwives was below average the local health authorities were aware of the position. The proportion of administrations was steadily increasing from year to year.

Air Pollution

Replying on July 21 to Mr. SOMERVILLE HASTINGS, Mr. A. E. MARPLES said a committee was being appointed jointly by Mr. James Stuart and Mr. Geoffrey Lloyd to "examine the nature, causes, and effects of air pollution and the efficacy of present preventive measures, to consider what further preventive measures are practicable, and to make recommendations." Medical men on the committee are Dr. J. L. Burn, medical officer of health, Salford County Borough Council, and Professor T. Ferguson, professor of public health and social medicine, Glasgow University.

Health Service Charges

Mr. H. MARQUAND asked the Minister of Health on July 23 whether he would present a White Paper reviewing the effects of the charges for appliances and treatment in the hospital and general-practitioners' services imposed in 1951 and 1952.

Mr. MACLEOD replied: No, Sir. This information could best be given by Parliamentary question and answer.

Mr. MARQUAND asked whether the Minister's attention had been drawn to a statement by Dr. A. J. Macleod

(*Supplement*, July 18, p. 40) to the effect that a recent speech by the Minister of Health suggested that he was anything but confident about the 1s. charge? Were they not entitled to more information?

Mr. MACLEOD said he was delighted to see this additional proof of the slow conversion of the Opposition to the point of view of those called Macleod, who came from the Western Isles.

Mr. BLENKINSOP asked whether the Minister did not recognize that the House welcomed the conversion of the British Medical Association to the point of view expressed always from this (the Labour) side?

National Service Boards

Replying on July 23 to questions by Mr. N. N. DODDS and Mr. J. SNOW, Sir WALTER MONCKTON said he was engaged in consultations with chairmen of medical boards. He had already arranged for the boards to be reminded of the importance of making a full inquiry into the candidate's medical history and of paying full attention to consultants' reports. He was amending the forms sent with the summonses to medical examination so as to draw attention to the fact that medical certificates or reports brought to the examination would be fully considered. Mr. H. Watkinson, the Parliamentary Secretary, had already started personal visits to medical boards. He proposed to do the same after the House rose. The most fruitful course would be to complete the steps which were already in hand and the examination of the individual cases brought to his notice. He also proposed to make a further investigation, with the co-operation of the Services and the Ministry of Pensions, into all cases of men discharged during a recent period shortly after entry with a view to determining the present extent of error and whether it appeared to arise most commonly in certain types of cases or districts.

Replying to Mrs. E. BRADDOCK on July 23, Sir WALTER MONCKTON said no instructions had been given that medical boards must not turn down more than a certain percentage of men in each of the categories. In answer to Mr. SNOW Sir WALTER MONCKTON said on the same date that about half the cases rejected by medical boards were psychiatric cases.

Mr. H. WATKINSON had said on July 21 that 25 chairmen of medical boards were over 70 years of age.

Strawberry Jam.—The average vitamin-C content of strawberry jam is 16 mg. per lb. (35 mg. per kg.). The corresponding value for the fresh strawberries used in the preparation of a pound of jam is 96 mg.

Medico-Legal

THE CHANGING LAW

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Few Englishmen really understand how the English constitution works unless they are professionally concerned, either as politicians or as lawyers, in helping to work it. In *The Changing Law*,* a collection of addresses given to English universities, Lord Justice Denning sets out to draw a picture of the changes by which the law is adapting itself to the social and constitutional revolution of our time. In doing so he provides the ordinary man with a vivid insight into the genius of the constitution, and shows how English law has developed, and is developing, to hold the balance between man and the State and between man and man.

Doctors will find much in the book of direct interest to them. They will see how one of the living masters of the Common Law treats the problems which have been discussed recently in the medico-legal columns of the *Journal*, and among the cases with which the theme is illustrated they will meet some old friends that have been reported there. They will see how actions for negligence against hospitals have served in the maintenance and development of the rule of law in the Welfare State and in the law of master and servant. They will find what Lord Justice Denning thinks of the M'Naghten Rules and the criminal responsibility of the insane in the situation pointed by the cases of Straffen and Miles Giffard.

Some of Lord Justice Denning's views upon the law do not command universal acceptance. Few, however, who read his book will fail to be glad that he has written it.

*Published by Stevens and Sons, London, 1953, pp. 122, 10s.

Universities and Colleges

UNIVERSITY OF ST. ANDREWS

The degree of M.D. has been conferred on J. Stephen Law.

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—Ann C. Alabaster, W. G. G. Brand, Florence M. Danjoux, A. M. Dick, A. A. Lakeru, J. A. Lawrie, C. S. Leithead, R. Markham, F. D. Marples (with commendation), C. A. H. Marr, Margaret A. H. Ness, R. G. M. Poston, J. Smart (with commendation), E. Sweeney, Mary E. C. Wright.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College held on July 21 with the President, Dr. W. A. Alexander, in the chair, it was announced that the following distinguished members of the medical profession had accepted Honorary Fellowship of the College: Professor Charles Herbert Best, F.R.S., professor of physiology and director of the Banting and Best Department of Medical Research in the University of Toronto; Sir Walter Russell Brain, President of the Royal College of Physicians of London; Sir Frank Macfarlane Burnet, F.R.S., director of the Walter and Eliza Hall Institute, Melbourne, Australia; Sir Charles Ernest Hercus, professor of bacteriology and public health in the University of Otago and dean of the Medical Faculty; Sir Gordon Morgan Holmes, F.R.S., consulting physician to Charing Cross Hospital and to the National Hospital for Nervous Diseases; Sir Robert Muir, F.R.S., emeritus professor of pathology in the University of Glasgow; Sir John Parkinson, consulting physician to the Cardiac Department of the London Hospital and to the National Heart Hospital.

The following were elected Members of the College: J. R. Bailey, W. A. Murray, M. A. Wafa, T. J. Danaraj, H. Foster, E. L. Davis, M. Macleod, R. S. Norton, M. Scott-Gray, G. J. V. Perera, D. E. P. Forbes, A. V. A. Vethanayagam, C. H. Gurd, H. P. Vaishnava, D. J. Gudex, Ata-Ul Haq, K. R. Tyler, R. W. H. Simmons, A. Pines, E. O. L. Hoskins, S. G. F. Wilson, S. I. Kuper, P. A. Rechnitzer, G. W. Allan, A. Nestadt, H. D. Jacobs, K. S. Husain, R. Kilpatrick.

SOCIETY OF APOTHECARIES OF LONDON

Sir Wilson Jameson, Master, presided at recent meetings of the Court of Assistants of the Society. Dr. C. F. White, Mr. A. M. A. Moore, and Sir Lionel Whitby were elected to seats on the Court. Dr. Frank Howitt was re-elected as the Society's representative on the British Postgraduate Medical Federation and Dr. G. Hamilton Hogben was appointed representative of the Society on the Central Council for District Nursing in London.

The Honorary Mastery of Midwifery was bestowed upon Sir William Gilliatt in recognition of his eminence in this field, and the Society's Gold Medal in Therapeutics was presented to Sir Charles Harington, F.R.S., in commemoration of his work which led to the synthesis of thyroxine. The presentations were followed by a soirée at which the Society's plate and other treasures were exhibited.

The Society's records from 1617 to approximately 1850 have been deposited in the Guildhall library.

The following candidates, having completed the final examination, have been granted the Diploma of the Society, enabling them (upon complying with the requirements of the Medical Acts) to practise medicine, surgery, and midwifery: T. P. Oliver, R. G. Orr, T. F. Stoyle, P. Jensen, S. T. Guest, J. Cottam, E. P. James, W. F. T. Davies, J. R. Croning, R. H. Morgan.

The following candidates were successful in the recent examination for the Diploma in Industrial Health: C. P. Chivers, K. B. Roy, R. Whitelaw.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **July 11** (No. 27) and corresponding week 1952.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953 Eng. & Wales	1953 Lond.	1953 Scot.	1953 N. Ire.	1953 Eire	1952 Eng. & Wales	1952 Lond.	1952 Scot.	1952 N. Ire.	1952 Eire
Diphtheria	17	2	7	0		30	4	8	2	1
Dysentery	525	109	107	4	3	180	51	51	3	2
Encephalitis, acute	5	2	0	0		5	0	1	1	
Enteric fever:										
Typhoid	6	1	2	0		2	1	1	1	2
Paratyphoid	3	0	2(B)	1		21	1	3(B)	0	
Food-poisoning	524	143		1		168	8		2	
Infective enteritis or diarrhoea under 2 years				27	31				8	22
Measles*	5,504	110	158	197	129	6,720	605	141	221	293
Meningococcal infection	38	4	6	1	1	23	0	16	1	1
Ophthalmia neonatorum	45	8	9	0		38	8	14	0	
Pneumonia†	315	18	143	4		314	15	143	7	1
Poliomyelitis, acute:										
Paralytic	118	15	7	5	5	61	5	5	5	
Non-paralytic	65	4				25	3			
Puerperal fever§	253	27	15	1	2	234	37	10	3	
Scarlet fever	1,072	66	149	29	67	1,036	92	201	4	49
Tuberculosis:										
Respiratory			135	26				127	33	
Non-respiratory			22	1				24	12	
Whooping-cough	4,407	374	336	44	60	2,344	104	130	73	98

DEATHS in Great Towns	1953 Eng. & Wales	1953 Lond.	1953 Scot.	1953 N. Ire.	1953 Eire	1952 Eng. & Wales	1952 Lond.	1952 Scot.	1952 N. Ire.	1952 Eire
Diphtheria	0	0	0		0	0	0		0	0
Dysentery	0	0				1	0		0	
Encephalitis, acute		0			0		0			1
Enteric fever	0	0	0			0	0		0	
Infective enteritis or diarrhoea under 2 years	10	1	2		1	11		2	2	1
Influenza	2	0	0		0	3	0		0	0
Measles		0	0		0		0	1	0	0
Meningococcal infection		0	1				0			
Pneumonia	100	15	9		5	118	24		9	8
Poliomyelitis, acute	8	2			0	0	0			0
Scarlet fever		0	0		0		0		0	0
Tuberculosis:										
Respiratory	79	5	13		7	93	13	6	2	7
Non-respiratory		2	2		0		4	3	1	6
Whooping-cough	1	0	1		0	4	0		0	0
Deaths 0–1 year	176	12	31		16	219	30	30	10	12
Deaths (excluding stillbirths)	3,985	557	509		141	4,610	683	552	108	153
LIVE BIRTHS	7,997	1149	921		364	7,661	1140	900	224	401
STILLBIRTHS	184	21	23			181	24	16		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending July 18 (28th week of the year) were as follows: paralytic, 147 (118); non-paralytic, 76 (65); total, 223 (183). This is an increase of 40 compared with the previous week, the figures for which are in parentheses. Districts which have notified 15 or more cases in the year to July 18, with incidences per 100,000 in parentheses, are as follows: Southend-on-Sea C.B., 24 (15.84); Liverpool C.B., 17 (2.15); Hendon M.B., 15 (9.63); Birmingham C.B., 35 (3.15); Coventry C.B., 38 (14.72); and Pewsey R.D.C., 16 (87.77).

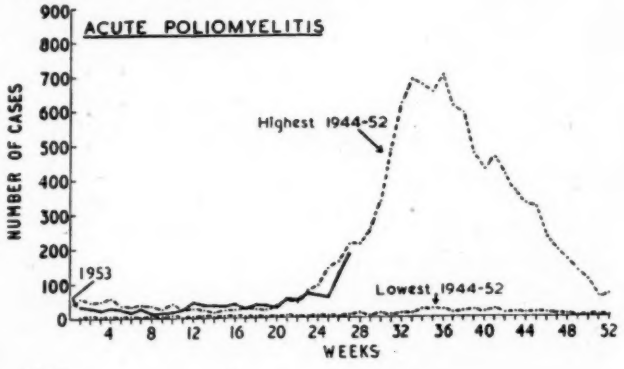
The momentum of the seasonal rise was unchanged during the 28th week. The number of notifications was greater than in the corresponding week of any previous year. A further increase must be expected, and the outlook is not favourable. The ratio of notified paralytic to non-paralytic cases remained constant at about 2 : 1. New cases were scattered widely, and apart from the outbreak in Pewsey R.D., which appears to be ending, there is no focus of unusual size.

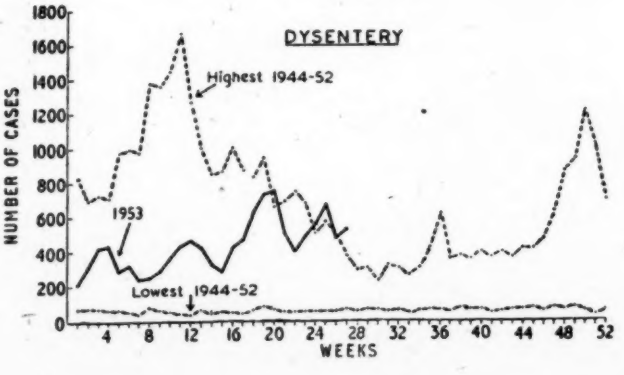
England and Wales Second Quarter

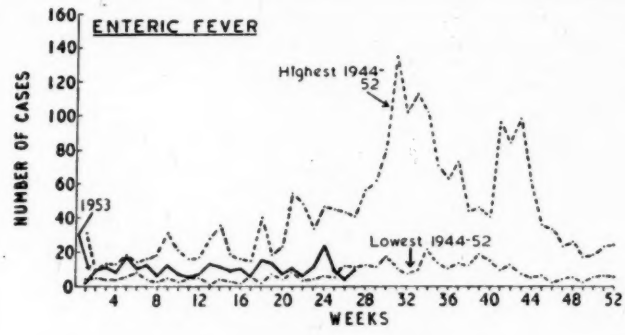
The birth rate, stillbirth rate, and infant mortality rate in England and Wales were slightly higher in the second quarter of this year than in the second quarter of last year. There were 179,464 births, giving a rate of 16.4 per 1,000 population. Stillbirths numbered 4,200, giving a rate of 22.9 per 1,000 total births; and there were 4,441 deaths of infants aged under 1 year, giving a rate of 25.6 per 1,000 related live births. The general death rate was 10.5 per 1,000 population, and there were 114,538 deaths.

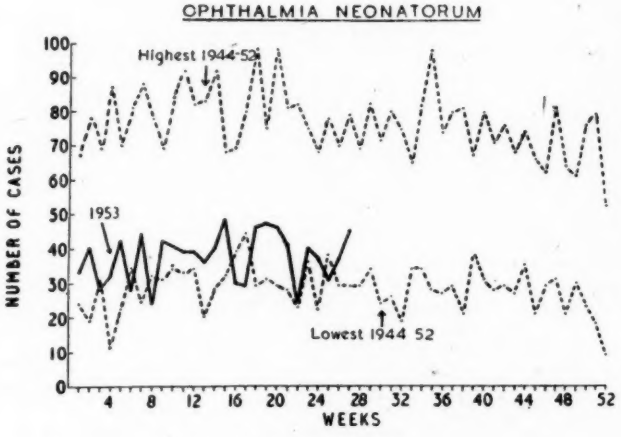
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944–52 are shown thus - - - - - - -, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Infectious Diseases

The returns of infectious diseases in England and Wales during the week ending July 11 showed a decrease of 1,106 for measles, from 6,610 to 5,504, and 283 for whooping-cough, from 4,690 to 4,407, and a rise of 57 for acute poliomyelitis, from 126 to 183, and 49 for dysentery, from 476 to 525.

The largest falls in the number of notifications of measles were 225 in Lancashire, from 1,274 to 1,049, 219 in Yorkshire West Riding, from 642 to 423, and 108 in Yorkshire East Riding, from 366 to 258. The largest variations in the returns for whooping-cough were falls of 65 in Warwickshire, from 312 to 247, 63 in Devonshire, from 178 to 115, 59 in Yorkshire West Riding, from 356 to 297, 57 in Staffordshire, from 207 to 150, and rises of 45 in Essex, from 348 to 393, and 42 in Lancashire, from 358 to 400. 1,072 cases of scarlet fever were notified, 6 more than in the preceding week, and no large variation occurred in the local trends. 17 cases of diphtheria were notified, an increase of 3 on the total of the preceding week.

The notifications of acute poliomyelitis were 33 more for paralytic and 24 more for non-paralytic cases than in the preceding week. Half of the increase was contributed by two counties—Warwickshire with a rise of 17 and Lancashire with a rise of 10. The largest returns were Warwickshire 20 (Coventry C.B. 3, Nuneaton M.B. 3, Atherstone R.D. 3), London 19 (Greenwich 3, St. Pancras 3), Essex 19 (Southend-on-Sea C.B. 4), Middlesex 17 (Hornsey M.B. 4, Ruislip Northwood 4), Lancashire 10 (Lytham St. Annes M.B. 4, Blackpool C.B. 3), and Sussex 10 (Worthing M.B. 3).

The largest centres of dysentery were London 109 (Deptford 10, Paddington 11, St. Pancras 28; the remaining 60 cases were scattered through 19 boroughs), Lancashire 100 (Liverpool C.B. 23, Preston C.B. 20, Manchester C.B. 14), Yorkshire West Riding 67 (Heckmondwike U.D. 24, Wakefield C.B. 10), Surrey 45 (Richmond M.B. 24), Norfolk 25 (King's Lynn M.B. 15), Middlesex 24, and Durham 19. 12 further cases were notified in the outbreak in Bedfordshire, Luton M.B., where 251 cases have been notified in the preceding weeks.

Two large outbreaks of food-poisoning were notified during the week—124 notifications in Islington, London, and 69 notifications in Easington R.D., Durham. 72 further cases were recorded from the outbreak in Lancashire; these cases were spread over 19 administrative areas.

Week Ending July 18

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,018, whooping cough 4,218, diphtheria 18, measles 4,795, dysentery 380, paratyphoid fever 5, and typhoid fever 4.

Quarterly Return for Eire

The birth rate for the March quarter of 1953 was 21.3 per 1,000 of the population and was 0.5 below the rate for the preceding first quarter. Infant mortality rate was 44 per 1,000 registered births and was the lowest rate ever recorded in a first quarter, being 11 below the rate for the March quarter of 1952. The general death rate was 14.3 per 1,000 and was 0.1 below the rate for the preceding first quarter. 294 deaths were attributed to respiratory tuberculosis and 74 to other forms of tuberculosis; these were 108 and 25, respectively, below the totals for the preceding first quarter. Deaths from infectious diseases included 252 from influenza, 18 from whooping-cough, 8 from measles, and 7 from acute poliomyelitis. Only one death was due to diphtheria. Gastro-enteritis was responsible for the deaths of 51 children under the age of 2 years.

Medical News

College of General Practitioners.—The first annual general meeting of the College of General Practitioners will be held on Saturday, November 14, at 2 p.m. in the Hall of the Society of Apothecaries, 14, Black Friars Lane, London, E.C.4.

First World Conference on Medical Education.—Details of the programme of this Conference (August 22–24) were published in the *Journal* of July 4 (p. 32). All those wishing to attend are advised to register as soon as possible by applying to the secretary of the Local Arrangements Committee, Dr. E. Grey Turner, B.M.A. House, Tavistock Square, London, W.C.1. To help to meet the expenses of the Conference, which are considerable, a registration fee of £4 is payable. Anyone interested in the work of the Conference may register, and registration confers the right to attend all meetings, excursions, and receptions. There will be a reception (6.30 p.m.) at B.M.A. House on August 22, and an excursion to Cambridge (10.30 a.m.) on August 23. On Monday, August 24, the Presidential Address on "The Challenge to Medical Education in the Second Half of the Twentieth Century" will be given by Sir Lionel Whitby in the morning, and the following addresses, also given in plenary session, will be delivered on Monday afternoon: "What is Education?" by Sir Richard Livingstone; "The History of Medical Education," by Professor John F. Fulton; and "Medicine—a Technology or a Profession?" by Colonel S. M. K. Mallick.

The Minister and the Dental Profession.—The Minister of Health, Mr. Iain Macleod, was the principal guest and proposer of the toast of "The Faculty" at the sixth anniversary dinner of the Faculty of Dental Surgery, Royal College of Surgeons of England, on July 17. When he became Minister, he said, one of the things that most needed doing was to improve the personal relationship between the Department, and more particularly the Minister, and the professions concerned with the Health Service. "I am not completely satisfied with the present position in relation to myself and the dental profession." Mr. Macleod went on to urge the best men not to be backward in playing their part in negotiations for the improvement of their profession. "It matters enormously that those whom I meet as representing the professions should be the leaders of those professions." Mr. Macleod declared that he looked forward to the estab-

lishment of a General Dental Council, but one of the difficulties was to find Parliamentary time for the necessary Bill. He ended his speech with a warm tribute to the Dean of the Faculty, Sir William Kelsey Fry. Among the other guests were Sir Cecil Wakeley, P.R.C.S., Sir John Charles, Dame Lillian Penson, and Dr. Bernard Johnson.

Commonwealth Bursaries.—The Royal Society and the Nuffield Foundation are jointly instituting a series of Commonwealth bursaries. Their object is to increase the efficiency of investigators of proved worth by enabling them to pursue research, learn techniques, or follow other forms of study wherever in the Commonwealth the environment is particularly favourable. The bursaries differ from ordinary research fellowships, the main emphasis being on improving the recipients' capabilities rather than on obtaining the solution of a particular research problem. Each bursary will provide for cost of travel and maintenance, but not for a salary as such; bursaries will be tenable for from two to twelve months. For the first five years the scheme will be on an experimental basis. During this period the Nuffield Foundation will contribute £5,000 a year, and the Royal Society will make an initial contribution of £2,500. Later it is hoped that funds may be obtained from other sources, particularly from overseas, to make possible the full development of the scheme. A joint Commonwealth Bursaries Committee has been set up under the chairmanship of Sir Edward Salisbury, F.R.S. It includes two medical members: Sir John Stopford, F.R.S., and Professor G. R. Cameron, F.R.S. Bursaries will be awarded biennially, and application forms (obtainable, with further details, from the assistant secretary, the Royal Society, Burlington House, Piccadilly, London, W.1) must be submitted not later than March 15 and September 15 each year. The bursaries are open to both United Kingdom and other Commonwealth scientists. The first applications will be considered early next year.

Foulerton Research Fellows.—Two physiologists have been appointed by the Council of the Royal Society to Foulerton Research Fellowships. Mrs. P. M. Holton, D.Phil., is to carry out work at the Physiological Laboratory, Cambridge, on chemical transmission in the nervous system. Mr. J. E. Falk, Ph.D., of University College Hospital Medical School, is to investigate the biochemical mechanisms involved in the production of porphyrins and haemoglobin.

School of Medical Photography.—A school of medical photography, provisionally designated the London School of Medical Photography, is being formed as a non-profit-making organization through the co-operation of eight London teaching hospitals. Its aim is to prepare students for the final examination of the Institute of British Photographers in medical photography. The institutions concerned are Guy's Hospital Medical School; St. Mary's Hospital Medical School; the Middlesex Hospital; The Hospital for Sick Children, Great Ormond Street; the Institute of Ophthalmology; the Institute of Orthopaedics; the Postgraduate Medical School of London; and St. Bartholomew's Hospital. Students must have passed the intermediate examination of the Institute of British Photographers; they should be ready for the final examination at the end of four terms. The school opens in October. Inquiries should be addressed to the honorary secretary, Mr. N. K. Harrison, Department of Medical Photography, St. Bartholomew's Hospital, West Smithfield, London, E.C.1.

Rabbits.—The present success of the virus of myxomatosis in controlling rabbits in Australia—it is estimated that in the last three years 80% of the rabbits have been destroyed—has led landowners there to raise a fund in honour of Dr. Jean McNamara, of Melbourne, in appreciation of her long campaign for its use. Dr. McNamara is well known for her work on poliomyelitis, for which she was made D.B.E. in 1935, and it was while working in the United States on a Rockefeller scholarship that she first conceived the idea of using myxomatosis virus for rabbit control. A less happy experience is that of a French doctor who used the virus to exterminate rabbits on his walled property. According to the *Manchester Guardian*, the doctor is now threatened with prosecution by the State, because the disease is rapidly spreading far beyond the walls of his estate. This is hardly surprising, as the virus is carried by mosquitoes.

"Family Doctor."—The August issue of *Family Doctor* has holiday topics well to the fore. There are articles on swimming, the hazards of picnicking, holiday housekeeping, and "How Hot Can You Get?"—the last giving some account of current research on climatic conditions and working efficiency. James Laver, writing on fashion and health, depicts some formidable corsets and even a machine for tightening their laces. In the Medicine and Health Section, Dr. T. Traherne discusses the causes of suicide, Miss Theodora Alcock advises on left-handedness and mirror writing, Dr. W. Edwards explodes some nature cures, and Dr. Doris Odlum tells parents how to bring up their babies the modern way. Constipation, stitch, baldness, and fat children are the subjects of other notes. For the profile, the work of the almoner has been chosen.

Mr. Arthur A. Gemmell was re-elected President of the Royal College of Obstetricians and Gynaecologists on July 25.

Mr. John Foster, senior clinical lecturer in ophthalmology in the University of Leeds, has been invited to deliver the Charles H. May Memorial Lecture before the New York Academy of Medicine in April, 1954.

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 37, No. 8) will be available in a week's time.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.

British Journal of Preventive and Social Medicine.—The next issue will be available in a week's time.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d.

These journals are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, August 3

EDINBURGH UNIVERSITY: FACULTY OF MEDICINE.—At West Lecture Theatre, University New Buildings, Teviot Place (Door 4), 5 p.m., Professor Shields Warren (Harvard): Pathologic Consequences of Total Body Irradiation.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Clarke-Williams.—On July 16, 1953, at Catterick Military Hospital, to Shirley (formerly Hinton), wife of Michael Clarke-Williams, M.B., M.R.C.S., a daughter—Marion Anne.

Cliff.—On July 16, 1953, at County Hospital, Hereford, to Margaret, wife of Dr. Philip Cliff, of Colley Horn, Mordiford, Hereford, a daughter—Pauline.

Dakin.—On July 10, 1953, at Grappenhall Maternity Home, Warrington, to Marjorie (formerly Pennington), wife of E. T. Dakin, M.R.C.S., L.R.C.P., a daughter—Julie Karen.

Edwards.—On July 22, 1953, at Argyll Nursing Home, Darlington, to Laurie, wife of Dr. D. R. Edwards, a son.

Gretton-Watson.—On July 16, 1953, at Chester, to Concetta, wife of Dr. B. G. Gretton-Watson, a daughter—Clare Lilian.

Holden.—On July 22, 1953, at King's College Hospital, Denmark Hill, London, S.E., to Ursula (formerly Stanley), M.R.C.S., wife of Surgeon-Lieutenant P. H. Holden, R.N., a daughter.

Laidlaw.—On July 25, 1953, to Greta (formerly Mair), wife of Dr. Allan J. Laidlaw, Barbourne Road, Worcester, a daughter.

Park.—On July 19, 1953, at 40, Wilbury Road, Hove, to Dr. Emily Park (formerly Smith), wife of Harold Park, F.R.C.S., a daughter.

DEATHS

Mason.—On July 5, 1953, at 14, Gainsborough Gardens, Hampstead, London, N.W., Francis Courtenay Mason, M.S., F.R.C.S.

Morris.—On July 7, 1953, at 19, Oak Road, Woolston, Southampton, Hants, the home of his son, Luther Morris, M.D., of Ashgrove, Brisbane, Australia

Pringle.—On July 12, 1953, John Pringle, M.D., D.P.H., of Hawkbarrow, Gosforth, Cumberland, formerly of Whalley Range, Manchester, Lancs.

Riley.—On July 8, 1953, at Nordale, Ben Rhydding, near Ilkley, Yorks, Donald Riley, M.B., B.Ch., aged 52.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Treatment of Congenital Cataract

Q.—*A child has greatly impaired vision owing to bilateral congenital cataract, one eye being more severely affected than the other. An operation on the worse eye has been suggested. What is the best age at which to do it? What results may be expected? If unsuccessful, is there any risk to the better eye?*

A.—When a child has bilateral cataract dense enough to create a serious obstacle to vision, the sooner operation is done the better. Useful vision is obtainable in a majority of cases, but it is impossible with a dense cataract to give a certain prognosis, because the fundus of the eye cannot be seen in detail until a clear gap is fashioned through the opaque pupil. The risk of damage being done to the other eye by operation on the first eye is only slight. There is *some* risk of sympathetic inflammation in the second eye whenever any intraocular operation is performed or whenever any perforating injury is sustained. Such a risk is negligible in the face of the alternative—namely, the sight permanently obstructed by cataracts.

Pregnancy after Cancer of the Breast Treated with X Rays

Q.—*Three years ago a patient was given x-ray therapy following a radical mastectomy for cancer of the breast (3,600 r to the chest wall and 2,700 r to the axilla). She is now two months' pregnant. Is there an increased chance that the foetus will be deformed?*

A.—It is difficult to believe that the ovaries can have received a significant dose of *x* rays, and it can be confidently stated that the previous disease and its treatment do not increase the risk of malformation of the foetus. A more important consideration in a case of this kind is the question whether pregnancy will activate any remaining cancer cells and precipitate a recurrence of growth. The evidence on this is equivocal, and opinions are divided. Nevertheless, some authorities would regard the risk as being so real as to justify terminating the pregnancy.

Gout in a Boy

Q.—*How decisive is the finding of a raised blood uric acid in the diagnosis of gout? A boy of 13 has for the last four years suffered intermittently from a polyarthritis until now presumed to be rheumatoid arthritis. However, three consecutive blood uric acid estimations have been 7.1 mg.%, 8.8 mg.%, and 7.3 mg.%. No tophi are to be seen, and there is no family history of gout. Are we justified, on the basis of these high blood uric acid estimations alone, in regarding this as a case of gout, and, if so, what treatment would be indicated in a boy of this age?*

A.—The blood uric acid may be raised in renal failure or when there is excessive nuclear destruction as in leukaemia, but if these conditions are excluded a blood uric acid of over 6 mg. is very strong evidence in favour of gout; it is not unknown for this disease to start in childhood, and to present as a polyarthritis. The onset of chronic symptoms at such an early age would indicate unusually severe disease with a poor prognosis.

If there are acute symptoms, treatment should start with colchicine, 0.5 mg. two-hourly, until there is some relief or until diarrhoea or vomiting supervenes (this may be expected after 3–6 doses). The dosage should then be reduced to 0.5 mg. six-hourly and gradually tailed off during the next six days. After the first few days, and when the gastrointestinal symptoms have subsided, sodium salicylate should be given four-hourly and the dosage gradually increased to the maximum that can be tolerated. This is likely to be in the region of 3 to 6 g. per day. If the treatment is successful there will be an obvious increase in uric acid excretion, and the blood uric acid should fall to normal levels in a few weeks. The salicylate therapy should then be continued indefinitely, and the colchicine may be repeated if there are further acute episodes. If this treatment is without effect other uricosurics such as probenicid ("benemid") may be tried. Dietary restrictions are of minor importance, though foods with a high purine content, such as liver, kidneys, sweetbreads, and sardines, should be avoided.

A Mouth Like a Parrot's Cage

Q.—*What is the reason for thirst and apparent dehydration after the ingestion of alcohol?*

A.—There is no satisfactory evidence that alcohol is a diuretic: the diuretic effect of alcoholic beverages is due almost entirely to the water which they contain. Some alcoholic drinks—for example, gin—do, of course, contain volatile oils (such as oil of juniper) which are diuretics, and these will cause a greater output of urine than if an equivalent amount of absolute alcohol had been taken.

The consumption of alcohol is followed by an increase in extracellular fluid over and above that due to the water in the drink; this extra fluid can only have come from intracellular water. A loss of intracellular water is probably the fundamental change which produces thirst, whether it results from reduced water intake, diuresis, sweating, haemorrhage, or the ingestion of alcohol. It gives rise to a cessation of salivary flow, dryness of the mouth, and a consequent craving for fluid.

Lotion for Cleaning Eye Sockets

Q.—*In a mission school for blind children in India a number of the pupils have had their eyes enucleated, and the sockets tend to become easily infected. What lotion is recommended for regular use to keep the sockets healthy?*

A.—The simplest lotion for eye sockets is normal saline solution. When a socket is slightly inflamed oxycyanide of mercury lotion in a strength of 1 in 10,000 is often beneficial. The disappearance of inflammation is usually expedited if the patient leaves off wearing an artificial eye for a few days.

Does Atmospheric Pollution Cause Sinusitis?

Q.—*Is there any evidence that dirt or fumes in the atmosphere are an aetiological factor in the production of sinusitis? I practise in a colliery district and must have seen some 50 cases of sinusitis last winter, many with a polyp in the antrum. Are certain districts more prone to this affection than others? What preventive measures can be taken to reduce the incidence of sinusitis?*

A.—There is no evidence to suggest that pollution of the atmosphere has any great bearing on the incidence of sinusitis. Infective sinusitis starts as a head cold which settles in one or other sinus because either the drainage from the sinus into the nose is not effective or the ciliated epithelium lining the sinus is unable to cope with the inflamed products of the mucous membrane. Sinusitis is prevalent in temperate zones where there are frequent temperature changes, and it is believed that such changes play an important part in the production of head colds. Upper respiratory infections are probably equally prevalent throughout the British Isles, and the main preventive measure in reducing the incidence of sinusitis is prevention of the causal upper respiratory infection. In some subjects obvious defects of nasal architecture, such as a badly deflected septum or unusually large middle turbinals, will require correction.

Cyanides in Industry

Q.—*In a factory laboratory one worker is constantly handling a sodium and potassium cyanide powder. What are the risks, and what precautions are advised? Would the wearing of a mask be advisable?*

A.—Sodium and potassium cyanide are widely used in industry and, handled with care, are relatively non-toxic. Danger arises when they are heated or acted upon by acids or moisture with the resulting evolution of hydrocyanic acid. They are poisonous, of course, if they find their way to the stomach. In the laboratory, where these substances can be properly stored and where the necessary precautions can be maintained, their handling should not be accompanied by any such risk. They should, of course, be properly labelled to prevent accidental ingestion.

The use of a dust respirator is not indicated, since it would be of no avail against hydrocyanic acid if this were present, and might give a false sense of security which could be dangerous.

Beeswax

Q.—*Is the wax from honeycombs harmless to eat? Is it absorbed, and, if so, in what form?*

A.—Honeycombs which have been made naturally by bees contain about 4.6% of wax. The wax consists mainly of esters of higher aliphatic alcohols with chains of 26 or more carbon atoms. From the high melting-points of these alcohols, and of their esters, it seems unlikely that they can be absorbed from the intestines when honeycomb is eaten upon bread in the usual way. The experience of bee-keepers confirms this view, and the wax is said to be mildly laxative. There would seem to be more chance of absorption, however, if the honey were used to make biscuits, cakes, or sweets under conditions which would cause the wax to become finely emulsified. From the lack of reports of harm resulting from eating comb honey it seems safe to conclude that the practice is quite safe. Common sense would suggest, however, that it is inadvisable to swallow large amounts of indigestible wax from which most of the honey has drained away. If the wax is absorbed at all it probably passes through the intestinal walls in the form of droplets of unhydrolysed wax; the esters of the higher alcohols are more difficult to hydrolyse than the triglycerides which are the main components of dietary fats. In modern bee-keeping the insects are often encouraged to start making honey promptly by providing them with combs made with paraffin wax. This material would be equally resistant to absorption, but again it might be partially absorbed if emulsified by cooking.

Eggs and Delirium

Q.—*A man with acute bronchitis was given nine eggs in milk in 18 hours. He became delirious and walked out of doors in his sleep. He has no known allergy to eggs. Could the delirium be ascribed to the ingestion of so many eggs?*

A.—It seems unlikely that the eggs were responsible for the delirium and sleepwalking. This number of eggs was frequently given to patients suffering from a gastric ulcer, and nothing untoward happened. It seems more likely that the acute bronchitis was due to a pneumococcal infection, or may have obscured a consolidation of the lung. It is well known that patients with pneumonia, when very ill and near the crisis, become delirious and may try to get out of bed. They may do some injury to themselves and try to jump out of the window. It is for this reason that the lower half of the windows can be opened only 10 inches (25 cm.) or so in many hospital wards. Nurses are taught that patients with pneumonia must be carefully watched and any attempt to get out of bed prevented, if possible.

Vasomotor Rhinitis and Antituberculous Therapy

Q.—*Is vasomotor rhinitis a recognized sequel to combined P.A.S. and streptomycin therapy? It developed four days after the start of a two months' course, and has persisted. What treatment is recommended?*

A.—Although sensitivity reactions, particularly in the form of skin rashes, are frequent during combined P.A.S. (*para*-aminosalicylic acid) and streptomycin treatment, vasomotor rhinitis has not been reported with significant frequency. It would be unusual for any sensitivity reaction to develop as soon as four days after the start of a course of treatment unless, of course, the patient had previously received either of the drugs. Whether or not any unusual symptoms and signs are due to either or both of the drugs can be quite easily determined. As soon as it is clear that the symptoms are persistent, both drugs should be stopped. If the symptoms do not clear up, then they are unlikely to have been due to a sensitivity reaction. If, on the other hand, the symptoms cease, then each of the drugs should be started in turn. In this way the drug responsible for the symptoms can be determined. In nearly every instance it is possible to desensitize the patient to the causative drug by administering first a dose too small to give rise to symptoms, and then progressively increasing this dose day by day until a full dose is being given. Of course, if the test of discontinuing the drugs shows that the vasomotor rhinitis is not due to either P.A.S. or streptomycin, the usual symptomatic treatment should be given. Antihistamine drugs such as mepyramine maleate, 50–100 mg. three times a day, should be used. Even if the condition appears to be caused by one of the drugs, it might be found that the symptoms of vasomotor rhinitis are so well controlled by the administration of a suitable antihistamine drug that the simplest procedure would be to continue with the course of streptomycin and P.A.S. together with the antihistamine.

Multiple Cervical Glands in Children

Q.—*What is the cause of the multiple small discrete glands in the posterior cervical region which are so commonly found in rather poorly developed children?*

A.—The cause is nearly always infection in the naso-pharynx, particularly in the adenoids.

Reactionary Haemorrhage after Antrostomy

Q.—*What is the best treatment for dealing with a severe reactionary haemorrhage following an antrostomy?*

A.—Severe recurrent haemorrhage following an intranasal antrostomy usually comes from the large blood vessel about half-way along the naso-antral wall, and this is implicated as a rule only when the antral opening has been made rather far back. When the blood vessel causes trouble some hours after operation, the inside of the antral cavity should be cleared of clots by suction, and the antral opening plugged with fibrin foam or gelatin sponge. On top of this it may also be necessary to pack some ribbon gauze around the antral opening, and also in the antral cavity. This is almost certain to stop any recurrence of haemorrhage.

Correction.—It is regretted that Crohn's disease was misspelt in the Refresher Course article on "Indigestion in Childhood" (July 25, p. 197).

All communications with regard to editorial business should be addressed to The EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.
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